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. . F. DASHIELL, Ph.D., Consulting Editor

PSYCHOLOGY

for

BUSINESS AND INDUSTRY

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PSYCHOLOGY
for
BUSINESS *and* INDUSTRY

BY

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Toronto and Montreal

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PSYCHOLOGY FOR BUSINESS AND INDUSTRY

PRINTED IN THE UNITED STATES OF AMERICA

TO

Professor CHARLES S. MYERS, *Director*

NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY, LONDON
WORLD LEADER IN INDUSTRIAL PSYCHOLOGY

PREFACE TO THE SECOND EDITION

The changes that have made the revision of this text necessary have been due not so much to the improvements in techniques that have taken place during the interval since its first publication as to the changes in emphasis that current problems in business and industry have forced upon psychologists. These changes have been in the following directions: a wider demand for the use of tests, greater awareness of the need for understanding the employee, increased emphasis on the presuppositions of tests and techniques, and the ever-recurring demand for tools that are practicable.

With the exception of approximately one-third of the contents, the original manuscript is reproduced. The additions and deletions have been the result of two factors: (1) suggestions that were offered by instructors who had used the text; and (2) increased experience gained by visiting the personnel departments of a large number of companies while making a survey of the use of tests for the National Industrial Conference Board, and by working with the members of personnel departments in a wide variety of organizations since being associated with an advisory agency.

I am especially grateful to the instructors who volunteered many constructive criticisms and to the reviewers of the first edition for the care with which inadequacies were noted.

HERBERT MOORE.

CHICAGO, ILL.,
October, 1942.

PREFACE TO THE FIRST EDITION

About ten years ago I began teaching Business Psychology and was constantly disturbed by the contrast between the results from laboratory experiments and the reported experiences of adult members of my classes. That contrast has been responsible for a gradual change in the contents of the course from the theoretical to the practical, with increasing emphasis upon those aspects of psychology which have been shown to be of value in the business and industrial worlds. This text is the result of that course. In it an attempt is made to introduce the student to those aspects of personnel problems in business and industry to which psychology has given, or can give, a contribution. Many aspects of personnel work are not included, partly because of the little that psychology has contributed to them and partly because of their being adequately discussed in books on management; such problems as group relations, the significance of union activities, and governmental interference in business, while partly psychological, are primarily economic and are adequately discussed in books on management problems.

To find out the uses to which psychology is being put in business and industry, it has been necessary to consult other than psychological journals, and it is upon such sources that I have depended for the majority of the illustrations and tables given in the text. I have made extensive use of the private publications or mimeographed reports of private organizations; to these organizations I am indebted for their cooperation and their willingness to convert into an "open book" any uses that are being made of psychological technique. Considerable use of the techniques that have originated in psychological laboratories is being made by personnel departments in industry, and in some cases rather notable advances in the use of the technique are to be found.

The people and organizations to whom I am indebted are legion. To my students at Northeastern University, who year after year have challenged some of my generalizations, I owe my interest in the applications of psychology to business and industrial problems. To Dr. Charles S. Myers, head of the National Institute of Industrial Psychology, London, I am deeply indebted for the opportunity to become familiar with the institute's method of analysis. Mr. T. O. Armstrong, personnel director of the Springfield division of the Westinghouse Electric and Manufacturing Company, gave me access to his files and records and to his supply of data that had been assimilated over a period of years. I am particularly

indebted to those who have aided in the writing and compiling of the manuscript: to Professor Rogers D. Rusk of the Department of Physics, Mount Holyoke College, for a careful reading and criticism of Chap. XI; to Dr. Ordway Tead, for a critical reading of the entire manuscript; to Professor Leslie G. Burgevin of the Department of English Literature, Mount Holyoke College, for reading, discussing, and criticizing each chapter and suggesting improvements in both logical development and methods of expression; and to my wife, who has edited, checked, and corrected each part in the various stages of preparation.

The following journals, publishers, and companies have given me permission to quote from their publications:

Journals: Everybody's (The Ridgway Company), *Occupations* (The National Occupation Conference), *The Personnel Journal* (The Personnel Federation), *The Harvard Business Review, The Human Factor, The Journal of Applied Psychology, The Monthly Labor Review, Management Review, Factory Management and Maintenance, Sales Management,* and *Personnel.*

Publishers: Fleming H. Revell & Company, Harper & Brothers, Henry Holt & Company, Prentice-Hall, Inc., Stanford University Press, The University of Pennsylvania Press, The Williams & Wilkins Company, The Harvard Traffic Bureau.

Companies: The General Electric Company (Cleveland and Schenectady), The Westinghouse Electric and Manufacturing Company (Pittsburgh and Springfield), The Carnegie Illinois Steel Corporation, The Dennison Manufacturing Company, The Metropolitan Life Insurance Company, The Phoenix Mutual Life Insurance Company, R. H. Macy & Company, The Probst Organization, The Psychological Corporation, The Institute for Research (Chicago), and the National Industrial Conference Board.

HERBERT MOORE.

SOUTH HADLEY, MASS.,
December, 1938.

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CHAPTER I

PSYCHOLOGY'S SERVICE TO BUSINESS AND INDUSTRY

INTRODUCTION

The chief task of psychological study is that of understanding man as an individual and as a member of society. The chief subject of the business and industrial psychologist is man in specific relationships with those parts of his environment that are affected by the business and industrial world. The immediate concern of the psychologist is with those phases of business and industry that are uppermost in the minds of both employers and employees at the moment.

The value of psychology to the world of business and industry is determined by the contribution that it can make to an understanding of the human forces that operate when people are brought together under the specific demands and controls that the business and industrial worlds make necessary. The extent to which it can help understand and find solutions for situations that are created by people with different abilities, different interests, different hopes, and different attitudes determines the extent to which it will join hands with the engineer and the economist in solving industrial problems.

The solutions that psychology may offer to present problems are determined, to a large extent, by the methods of approach that it has found to be of value in the past; the present stage of any science is rooted in its past, and can be understood only in terms of its history. Adequate presentations of that are available elsewhere.[1] A short but crowded past, thronged with experiments and speculations, successes and failures, promises and disappointments, forms the background of a challenging present, in which the problem of human relationships is uppermost in the consciousness of both employer and employee, from both of whom comes the plea for concrete suggestions that will prevent misunderstandings and correct mistakes.

[1] VITELES, MORRIS, *Industrial Psychology*, pp. 40–56, W. W. Norton & Company, Inc., New York, 1932; MOORE, B. V., and G. W. HARTMANN, *Readings in Industrial Psychology*, pp. 1–8, D. Appleton-Century Company, Inc., New York, 1931; MYERS, C. S., *Ten Years of Industrial Psychology*, Sir Isaac Pitman & Sons, Ltd., London, 1931.

Until recent years the assumption of both man and industry was that activity was compartmentalized. Man was supposed to have a number of selves, each one of which, thanks to William James, was thought to be different and to have no necessary relationships with any other. Self-expression varied, depending upon which part of the self was active; and the separation of one's economic, religious, social, or practical activities into unrelated groups was the necessary inference. So organizations with a multiplicity of departmental selves saw no essential functional relationship between any two. The only departments with a continued history of necessary relationships were the production and the sales department, and different parts of these were kept unrelated until "coordinators" and "efficiency experts" pointed the way to the reduction of stock, the elimination of production peaks, and the distribution of production schedules in terms of past sales records, instead of in terms of hopes, guesses, or orders on hand. But the relationship established between these departments did not characterize others, some of which in the past quarter of a century have had a mushroom growth and an equally rapid death. The employment department, the medical department, the training department, the safety department, the benefit department, and the management department were often introduced as self-contained units, functioning independently or dictatorially in their relationships with other departments.

When the personnel department was added to an already overcrowded list, it took on the same status: the personnel man took care of personnel problems; but it was soon discovered that his job was hopeless and impossible without the cooperation of every man, certainly every man in any way responsible for the work of others, in the organization; his work could be effective only when the problems with which he was most concerned were shared by every person in the organization who held any form of executive position.

When he was operating a self-contained department, the personnel manager, or industrial relations manager, as he was often called, confined himself to the outskirts of his job, and very rarely took an active part in studying or helping to solve the more intricate problems which have always existed but which labor unions are bringing to the fore today. Providing better physical conditions, studying the most suitable working methods, and removing obstacles to efficient work were the sum total of his contribution.

However, it was soon learned that environmental factors were but a small part of the forces that affected workers: a slowing down of the customary work pace, a marked increase in the number of rejections, and complaints about working conditions were discovered to be caused, not by environmental factors, but by such personal factors as a diminu-

tion of interest in work, conflicts between workers and their supervisors, and personal problems that were not immediately related to the production task. It is with these that the modern personnel manager is concerned; and it is in the solution of such problems as these that the accumulated knowledge that has been gained by psychologists in their laboratory experiments, in their field surveys, and in their clinical experience has some value.

What that solution may be can be known only when the problems are clearly understood and seen in their interrelationships, not only with one another, but with the drives and aims, the desires and hopes, the interests and wills of both employer and employee. As Ordway Tead says,[1] "Every major management problem is in part psychological." What management expects of or fears from the employee, not only in the way of production records, but in the form of attitudes, loyalties, and cooperative efforts, is as important a subject of psychological research as what management wants to know about the resources, the desires, the motivations, and the capacities of its employees. What the worker wants from management, not only in the form of pay, but in the form of security, opportunity for advancement, and protection, is as important to the psychologist as what he wants for himself in the form of self-expression, recognition, and acceptable conditions under which to work.

Industry today is abolishing the divisions, not only between departments, but between employer and employee; joint conferences, employee representation schemes, and collective actions are placing the objectives of both employer and employee in a common pool, and until these objectives mix properly, conflict is inevitable. The aims and plans of the employer must harmonize with the impulses and satisfactions of the employee; reconciliation of the two is possible only when the motivating forces on the one side are as well defined and clear cut as they are on the other.

Psychology has, from its inception, been concerned with these motivating forces, and has sought an interpretation of them in whatever form or situation they may find expression. Its primary concern is a better understanding of their nature and a proper adjustment between the energy that they represent and the inhibiting forces that prevent their complete expression. The forms through which these forces operate in business and industry are best represented by the types of problem which the average businessman and industrial relations department face today. It is true that psychology has contributed but little to some of them. On the other hand, the basic principles on which the solutions of them rest have been the assumptions of psychological procedure ever

[1] Tead, Ordway, Trends in Industrial Psychology, *Annals of American Academy of Political and Social Science*, 149: 110, May, 1930.

since experimental work of this kind began; and in many phases of these problems, the contributions from researches by psychologists have provided the technique that has given a solution to the difficulty.

PSYCHOLOGICAL PROBLEMS OF BUSINESSMEN

Some indication of the type of problems, of a psychological nature, that are baffling to businessmen is given in a study made by H. W. Hepner.[1] In 1929 he made an attempt to discover the most frequently

TABLE 1.—PSYCHOLOGICAL PROBLEMS OF BUSINESSMEN

		Per Cent
1.	Remembering names and faces of people	75
2.	How to make employees enthusiastic and energetic	72.6
3.	How to obtain the maximum amount of work from employees	68.4
4.	Ability to forget business and enjoy yourself after working hours	66.6
5.	How to get employees to cooperate with others	62.4
6.	How and when to praise an employee	60.0
7.	Selecting suitable men for promotion	58 8
8.	When hiring, what questions should be asked	58.8
9.	How to turn down a salesman in such a way that he will respect your decision and call again, or not, as you wish	58.2
10.	Satisfying disgruntled customers so as to keep their trade	58.2
11.	How and when to reprimand an employee	58.2
12.	Praising the men or explaining their faults to obtain better work	56.4
13.	How one should act toward competitors	55.8
14.	Refusing an employee a raise in pay and at the same time keeping him working, unprejudiced and ambitious	55.2
15.	How to get the most out of your time while at work	55.2
16.	Extension of credit to customers	54.6
17.	Advance of pay to employees	54.0
18.	How to be stern and commanding and yet keep employees' good will	54.0
19.	How to make a good impression when entering a business office	54.0
20.	How to make men satisfied with their work	53.4
21.	How intimate executives should become with employees	53.4
22.	How kindly to refuse a man	53.4
23.	Assigning jobs according to ability and character of the man	52.2
24.	How to deal with cliques and petty jealousies among employees	52.2
25.	How to deal with the employee who constantly complains	52.2

occurring problems of men in business. Approximately 500 businessmen were interviewed and asked to list those problems, psychological in nature, which in their experience were most acute. As a result of this survey, 97 problems were tabulated and submitted to several hundred businessmen. The replies from 167 of these, selected at random, were tabulated, and the per cent reporting each problem was calculated. In Table 1, the

[1] HEPNER, W. H., *Psychology in Modern Business*, pp. 9–13, Prentice-Hall, Inc., New York, 1931.

results from the first 25 problems are given, with permission from the author and the publisher.

Ten years later 35 personnel managers were asked to list the problems with which they were concerned.[1] Table 2 gives the rank order in which the most frequently mentioned problems were listed.

TABLE 2.—PROBLEMS CONFRONTING PERSONNEL MANAGERS

1. Improving methods of selecting and placing workers
2. Improving methods of supervision
3. Developing better training methods
4. Opening chances for initiative and leadership
5. Developing cooperation among workers and employers
6. Improving methods of promotion and transfer
7. Adjusting employees to their jobs and their environment
8. Installing better accident-prevention programs
9. Making job analyses and job specifications
10. Developing methods of testing and rating
11. Training employees in how to get along with other people
12. Improving illumination
13. Strengthening the health service
14. Developing time-and-motion-study methods
15. Inaugurating pay methods in the interests of employees
16. Eliminating fatigue
17. Studying atmospheric conditions
18. Bettering home and community conditions
19. Reducing distractions
20. Developing recreation and entertainment facilities
21. Adjusting monotonous operations to ability and interest

A survey of these two tables will indicate that many of the problems that are faced by the present-day businessman and personnel manager are those with which psychology has been confronted since the applied field has been recognized as one with which it should be concerned.

Additional indications of the problems of a psychological nature with which modern industry is confronted are given in a summary of the problems that industry is asking psychologists to solve[2]:

1. Will prospective employees gain anything by visiting the plant?
2. How should chronic complainers be handled?
3. How can uneducated old-timers handle educated understudies?
4. What is the attitude of the employee toward the employer?
5. What psychological factors can help account for the growth of unionism during the past 5 years?
6. How should employees' grievances be handled?
7. How can jobs be guaranteed, and what are the pros and cons?

[1] GOODE, C. E., and O. C. TRIMBLE, Industrial Uses for Applied Psychology, *The Journal of Applied Psychology*, 18: 173–176, 1939.

[2] SCHULTZ, R. S., Cooperation of Men, Management and Psychologists in Industrial Relations, *Jour. Applied Psychol.*, 18: 733–740, 1939.

8. What part can psychological tests play in hiring?
9. How can a job applicant's stick-to-itiveness be ascertained?

These represent the problems with which industry is faced and to which psychology should give a solution. The contribution that it can make may well be indicated by a brief description of a few of the attempts that have been made in the past.

REPRESENTATIVE SOLUTIONS

The following summaries are representative of the solutions that psychologists offered in the early days of their interests in the problems that the business world faced; they are the starting points of a 25-year growth, and are indicative of the method of attack that psychology has introduced into the world of business and industry.

I. Among the applied fields in which psychologists have taken an interest, advertising was one of the first; as early as 1903, before psychology had established itself as an experimental science, Dr. W. D. Scott published the first book written by a psychologist in the interests of the problems of the business world, *The Theory of Advertising.* This was followed in 1910 by another of his, *The Psychology of Advertising,* and in 1911 by still another, *Influencing Men in Business.* In this latest book Scott formulated the following four problems, which were confronting businessmen, and to which he thought psychology could make a contribution:

a. How may I induce my employees to improve the quantity and quality of their work?
b. How may I induce particular men to enter my employ?
c. How may I sell my line of goods by personal appeal?
d. How may I induce you to purchase the same line of goods if I confine my selling to printed advertising?

Scott attempted to give answers to only the last two of these problems, and for the solution of these he offered two tools: argument and suggestion, and gave a priori justification for the conditions under which both may be used.

Argument, he contended, can be effectively used:

a. When exploiting any new thing. Men are persuaded to change their habits and customs by argument.
b. When exploiting anything having unusual features.
c. When selling any article in which any form of persuasion must be used, it is necessary to have "reason-why" and "data-built" copy.
d. When influencing professional buyers who habitually analyze and compare, and who purchase merchandise not because it is good but because it is better.
e. As a subtle form of flattery an argument convinces the buyer that he is following his reason.

Suggestion, he contended, can be effectively used:

a. When there is not sufficient time at one's disposal for argument.

b. As a means of securing action, following conviction.

c. As a means of supplementing other selling techniques and changing threatened defeat into success.

d. When dealing with the general public, with whom suggestions are more effective than any possible massing of facts and figures.

e. When eager for immediate action.

The arguments offered by Scott for the place of suggestion and argument in the act of selling and the process of advertising were based on very little experimental work; for the most part, they were the product of the type of psychology most prevalent at that time—armchair soliloquizing. A more scientific type of work that is related to the same field was produced at about the same time by E. K. Strong, Jr.,[1] in a report, The Relative Merit of Advertisements, in which an attempt was made to determine whether or not psychological tests can be used to estimate the value of advertisements before they have been published, and if so, to what extent. As there were only three psychological studies in the field of advertising previous to this,[2] and no established method for approaching the problem, Strong borrowed the order-of-merit method from Cattell, and applied it to the problem of selecting the most persuasive of advertisements that had already been in use. Ten different advertisements of each of three commodities—vacuum cleaners, pianos, and breakfast foods—were presented to 10 subjects, who were asked to "arrange them in a descending series of merit as to persuasiveness," and from the averaged results the rank position of each advertisement was determined. Then he made up a number of advertisements, 20 each for breakfast foods and soap, and asked two groups of subjects to arrange the advertisements in order of their persuasive power. Fifty people ranked the breakfast-food advertisements in order of merit, and the resulting rank order ranged between 5.6 and 15.9. The soap advertisements were given to 101 men and 95 women in the academic world, and to a miscellaneous group of 97 men representing farmers, businessmen, and doctors. The rank position given the advertisements by the men ranged from 3.9 to 18.8, and by the women from 2.7 to 19.1.

The degree of correspondence between the two groups seemed to indicate that the method had promise, and in consequence a more thorough study was undertaken with advertisements of Packer's Tar

[1] Strong, E. K., Jr., The Relative Merit of Advertisements. A Psychological and Statistical Study, *Archives of Psychology*, No. 17, 1911.

[2] Gale, H., On the Psychology of Advertising, *Psychological Studies*, 1: 39–69, 1900; Hollingsworth, H. L., Judgments of Persuasiveness, *The Psychological Review*, 18: 234–256, 1911; Starch, D., The Psychology of Preferred Positions, *Judicious Advertising*, Apr. 5, 1910, pp. 8–14.

soap. Fifty advertisements that had been used at different times were given to varied groups of judges, each of which was asked to make three judgments of the attractive power of the advertisements:

a. To arrange them in 10 piles according to the order in which the advertisements would cause them to buy the soap, pile No. 1 containing those advertisements whose soap they felt very much attracted to buy, and Pile No. 10 those advertisements whose soap they felt they would not buy.

b. To rearrange the advertisements into as many piles as they wished, putting similar advertisements in each pile.

c. To reclassify the advertisements on the basis of their appeal, putting in the No. 1 pile those that gave no appeal and in successive piles those that conveyed increasingly strong appeals.

The results from the three groups of judgments gave a high degree of correlation, not only among the different groups of judges, but also with the estimated results from the advertisements by the company; in some cases the correlation among different groups of judges reached as high as .87. Strong was quite convinced that in the proper use of the order-of-merit method there was a tool that could be successfully used to eliminate a considerable part of the guesswork from advertising.

A great deal of experimental work on the problem of advertising has gone through the mill since 1911, and improved techniques for evaluating the form the advertisement should take and the results the advertisement has brought or is likely to bring have been applied in a wide variety of cases. The nature of these techniques and the psychologist's contribution to the problem are discussed in the chapter on Advertising.

II. An entirely different approach to an entirely different problem was made by Hugo Münsterberg, and reported in his *Psychology and Industrial Efficiency.*[1] Feeling that psychology had then reached the stage in which it could "speak the language of an exact science in its own field," he suggested that there were three problems to which it could offer solutions:

a. Finding men whose mental qualities best fitted them for the work they had to do.

b. Discovering the psychological conditions under which every man can give the greatest and most satisfactory output of work.

c. Discovering how the influence on human minds which business is anxious to create can best be developed.

The contribution that the new science could make to these fields can best be illustrated by the method of solving one problem that was given him. For some years many cities were disturbed by the number and frequency of streetcar accidents, some having as high as 50,000 accident-indemnity cases in one year. In the winter of 1911 the American

[1] MÜNSTERBERG, HUGO, *Psychology and Industrial Efficiency,* Houghton Mifflin Company, Boston, 1913.

Association for Labor Legislation called together a group of vocational specialists to discuss possible solutions of the situation; one result of the conference was a request that Münsterberg make a study of motormen in order to discover the factors that differentiated the accident-prone from the free-from-accident drivers. After observing a number of motormen in action, he felt that the differences between the two groups were primarily due to their capacity to attend to the multitude of phenomena which crossed their field of vision, and to make rapid decisions and speedy reactions. To test these capacities, he devised a number of problem situations, one of which is illustrated in Fig. 1. Before selecting the type

4	*1*	3	*2*	H	2	*4*	1	*3*
3	*4*	1	*2*	G	2	*1*	*3*	*4*
2	4	*3*	1	F	*4*	1	*2*	3
1	*2*	3	*4*	E	2	*3*	4	*1*
4	2	*1*	3	D	*1*	4	*3*	2
1	4	*3*	2	C	4	*2*	3	*1*
3	*4*	2	*1*	B	*3*	4	*2*	1
2	1	*4*	3	A	4	*1*	2	*3*

Notations:

Digit 1 represents a pedestrian moving 1 step. Digit 2 represents a horse moving 2 steps. Digit 3 represents an automobile moving 3 steps.

The bold face lines on either side of the column of letters represent a railroad track. Bold face digits represent men, horses, and automobiles moving parallel to the track, and not sources of danger.

Italicized digits are danger signals when: Digit 1 is one space-interval from the track. Digit 2 is two space-intervals from the track. Digit 3 is three space-intervals from the track.

FIG. 1.—Speed and accuracy test for motormen. (*After Münsterberg.*)

of test that might be differentiating, he surveyed the field and on solely a priori grounds discarded the type of test that has since been found to be of very little value, *viz.*, the miniature test, in which the actual situation is represented in doll-like form. Instead, he attempted to construct the type of problem that would transport the motorman in imagination to the actual situation, and make him "feel" that he is going through the same types of task that he performs when on the job. Figure 1 represents a street scene with the railway tracks in the center of the street, and pedestrians, horses, and motorcars moving in every direction along the street.

In order to get a device that would be subject to control and measurement, Münsterberg selected 12 cards, each provided with a handle, and put them face up in a pile underneath a glass plate, which was placed in a black box and completely covered by a velvet belt 8 inches broad, in the center of which was a window 4½ inches wide and 2½ inches long. Two cylinders were placed one at the front and one at the rear end of the box, and turned by means of a metal crank, which rotated the velvet belt over the glass plate at varying rates, thus permitting different exposures of the track and figures. The window permitted an exposure

five units lengthwise and nine units in width. The subject of the experiment turned the crank, and as the window moved the length of the card, he called the letters of those units in the field which represented the danger signals for the motorman. This procedure was repeated for all 12 cards.

For subjects Münsterberg had a number of the best motormen in the service of the Boston Elevated Railway System, an equal number "who had only just escaped dismissal and whose record was characterized by many more or less important collisions or other accidents," and another group of average motormen. The results showed marked variations between the different groups; the time ranged from 140 to 427 seconds, and the omissions from 4 to 28. Münsterberg does not give any statistical results to show how effective the test procedure was, as technique for evaluating the reliability and validity of such testing procedure had not then been developed, but he does give two proofs of the merits of the experiment:

a. "The tried motormen agreed that they really pass through the experiment with the feeling which they have on the car" (page 74).

b. "The results show a far-reaching correspondence between efficiency in the experiment and efficiency in the actual service" (page 75).

Experimental apparatus based on the same principle, *i.e.*, creating a situation representative of that in which the worker operates, was devised for the selection of ships' officers, telephone operators, pencil factory workers, and those engaged in a number of other types of industrial operations. In many cases surprisingly satisfactory results were gained.

The technique that Münsterberg used was far from being as scientifically accurate as some that are in use today; no job analysis preceded the setting up of his testing equipment, no method of validating his results was used, and quite often an unjustifiable claim for the differentiating value of his technique was made, without either observer or reader of his reports being able to find more than chance results; but his pioneer work paved the way for the introduction of more valid methods, and temporarily accentuated industry's conviction of the value of the psychological approach, although that was often identified with the wiles of the necromancer and crystal-gazer. The chapters on Testing the Applicant describe some of the more reliable measures in use today.

III. Another of the early studies in the application of psychological methods to industrial problems was made under the direction of Dr. E. L. Thorndike in cooperation with other members of a newly appointed New York State Commission on Ventilation. One of the studies made by appointees of that commission is reported by Dr. L. J. Stecher.[1] The problem confronting the commission was the effect of ventilation and

[1] STECHER, L. J., The Effect of Humidity on Nervousness and on General Efficiency, *Arch. Psychol.*, No. 38, 1916.

humidity on the mental and physical condition of the worker; the phase of the problem on which Dr. Stecher worked was the way in which different degrees of humidity affected the worker's performance, either of the mental or of the muscular type.

For experimental equipment she had a room 10 by 14 by 10 feet, and a control room fitted with heating and cooling devices and with apparatus for humidifying and drying the air, "so that any air condition met in practice could be reproduced, and the different factors in the air environment studied independently" (page 27). Her subjects were 29 girls, ages seventeen to eighteen, divided into eight squads, A–H, each of whom spent 2 weeks at the experimental station; during one week they were given work to do under "wet" conditions, 50 per cent relative humidity, and during the other week they were given the same task under "dry" conditions, 20 per cent relative humidity.

In addition to physiological observations of pulse, temperature, and eye tremor, made by the experimenter, each subject was given two types of tasks:

a. Mental problems in addition and multiplication.
b. The following tests of motor control and coordination: fatigue, tapping, aiming, typing, mirror drawing, hand and arm steadiness, and reflex wink.

The results from the two periods, which alternated with successive squads, were compared. The net results from the experiment were inconclusive and contradictory; in only two tests were there reliable differences shown under the two types of working conditions: the subjects did the hand-steadiness test better under wet conditions, and the tapping test better under dry conditions; in all other tests there were variations from group to group, and quite often within the same group; for example, addition was done better under wet conditions by groups C, D, G, and H, and under dry conditions by groups A, B, E, and F; the fatigue tests were done better by the A, B, C, and D groups under wet conditions, and by the E, F, G, and H groups under dry conditions.

While these results were inconclusive, they pointed the way to the study of environmental factors that affect the worker, and they set the pace for a large number of studies on every phase of the workers' environment. The chapters on Employee Accidents and Employee Fatigue give the results of some of the more important of them.

IV. At about the time that these experiments were being carried on in university laboratories and institutions, psychology was being introduced in industry. Two reports of these experiments are given here.

A. In 1919 Miss E. O. Bregman was invited by a large New York City department store to test out the value of psychological procedure in the

selection of its employees.[1] Even at that comparatively late date there were scarcely any tests available that were applicable to the type of problem she was asked to help solve, and there was very little in psychological literature that bore directly on the problem. She chose as her tests two forms of a modification of Trabue's language completion test, in which one or two words in each sentence are omitted and the subject is asked to make the completions. The exercises were arranged in order of supposed difficulty and given to 15,071 applicants for positions, and also to selected representatives of different groups in the personnel of the store. The results from the tests of 51 of the executives were compared with an estimate of the executives' promise made by a general manager and an assistant manager, who classified them into three groups: most able, average, and least able. The joint ratings were regrouped into five classes:

a. Those whom both judges agreed on as being most able were put in Group 1.

b. Those ranked in class 2 by one rater and class 1 by the other, or vice versa, were put in Group 2.

c. Those whom both judges agreed upon as being average were put in Group 3.

d. Those put in the average and least able classes by different judges were put in Group 4.

e. Those put in the least able class by both judges composed Group 5.

Her method of grouping the judgments was a little naive, but at that time such tools as regression equations and multiple correlations were not the common property of testers, and in consequence a regrouping of discordant judgments was the only accessible tool for making comparisons. The average scores made by the different groups were as follows: *a* 41, *b* 31, *c* 30, *d* 28, *e* 25. The tests needed only 10 minutes each to take and could be corrected in less than 2 minutes; they showed sufficient differences among the different groups to persuade the management to continue with that type of examination and to extend it to other groups.

Tests of a different nature were then devised for clerical workers and salesgirls, and in each case the results were compared with supervisors' ratings; the results showed a marked and consistent difference between the "very good" and the "average" workers, and seemed to offer such promise that the management immediately adopted them "in connection with the employment of sales and clerical workers."

B. In the same year that Miss Bregman introduced tests into a department store, Miss Emily Burr undertook a more scientific study of factory workers, in order to set up a testing program that would differentiate the more and the less promising.[2] Already a number of industrial con-

[1] BREGMAN, ELSIE O., Studies in Industrial Psychology, *Arch. Psychol.*, No. 59, 1922.

[2] BURR, EMILY, Psychological Tests Applied to Factory Workers, *Arch. Psychol.*, No. 55, 1922.

cerns had been experimenting with tests; in 1915 the American Tobacco Company engaged W. D. Scott to introduce some tests for selecting salesmen, and by 1916 one of the assistants, J. M. Bruce, was using the tests to determine "fitness, imagination, discernment, tenacity, address, and personality"; the Bell Telephone Company had introduced some to determine "the degree of dexterity, memory, attention, accuracy, and intelligence possessed by would-be employees"; the Curtis Publishing Company had introduced some to determine "the efficiency and accuracy of their stenographers and clerks"; the Dallas Consolidated Company had some "to test the powers of observation of the workmen"; Cheney Silk Manufacturers were using some "to select high-grade clerical workers and minor executives"; and the firm of Joseph and Weiss was using some "to select executives and operatives."

Before Miss Burr's work, little attempt had been made to base testing procedure on systematic job analysis; her technique was far inferior to that later developed by the Gilbreths, but it was at least a recognition of the necessity of such a study before an adequate start could be made.

> Several days were spent in observing the work of the factory and studying the operations in the different departments. The Experimenter . . . tried each new type of work herself so that the analysis might be as accurate as possible. Various members of the firm, as well as the heads of the departments and the factory heads themselves, were interviewed.

Improvements on this method of analyzing the job in terms of human demands have made rather remarkable strides during the past 20 years, but the method used by Miss Burr still forms part of present-day procedure and replaces the armchair method on which Münsterberg relied so much. Her observations and experiences convinced her that operatives need to show ability to comprehend and carry out instructions, to make good eye-hand coordinations, to be better than average in manual dexterity, to be able to discriminate between colors, and to give evidence of above-average capacity for remembering, judging, and assuming responsibility.

Her work was in six departments of a feather and fancy ornament factory; 75 workers were the subjects of her experiments, approximately equally divided among the six departments. The results were compared with the rank position, per department, given the workers by the manager, the foreman, and two of the forewomen. Miss Burr, with confidence in the value of her comparisons, says, "It will be apparent that a rank order arrangement of the employees made by taskmasters who watched the performance of these workers for a period of months is not to be gainsaid" (page 62).

For her test battery she selected two groups of tests:

a. A *general* group for testing intelligence (using the Goddard Revision of the Binet-Simon test), association (using three types of tests: opposites, relations, and substitutions), cancellation (using digits and symbols), linguistic (using completion exercises and proverbs), and easy and hard directions tests.

b. *Special* tests for industry, in which she included tests of judgment, sorting capacity (three types of tests), color discrimination, motor control, and tests of form and weight discrimination.

Each test was correlated with the criterion, and those which showed sufficiently high reliability and validity were selected for use in hiring the factory workers. Three tests in the *special* group proved to be of value—the card-sorting test with a validity of .73, the No. 2 sorting test with a validity of .60, and the motor-control test with a validity of .80. In this group also there were two tests—the feather-sorting test and the judgment test—"which the firm found of so much value that it was adopted immediately by the employment foremen" (page 70).

These studies by Drs. Bregman and Burr have been the forerunners of innumerable types of studies in many industries during the past 25 years; starting in with the problem of selecting the most suitable worker, psychologists have extended their activities to studies of record systems, management methods, production control, factory layout, lighting and atmospheric conditions, and training methods; the extent of their contribution to industry has increased annually for the past 25 years, and has been widening, owing in part to the interest of individual psychologists and in part to the activities of psychological organizations that have been founded with a view to providing more adequate service for business and industry. A summary of the activities of those organizations which have been most active in the English-speaking world will serve to indicate the nature of the service which psychology is rendering the world of business and industry.

REPRESENTATIVE PSYCHOLOGICAL ORGANIZATIONS SERVING BUSINESS AND INDUSTRY

As soon as it was known that the new science of psychology could be of value to the world of business and industry, it was felt that that service would be more adequate if it were offered under the direction of professional organizations; in this manner two objectives could be secured: (*a*) There would be a more certain guarantee of the scientific validity of the services that were being offered, (*b*) the type of service which business was asking from psychology could be more adequately rendered. With very few exceptions business has not felt the need of the continued presence of a psychologist in the organization; the type of service that is of value, and for which there is a felt need, is occasional and intermittent

more often than constant; for that reason the services of a reputable organization can serve the occasional needs of business and industry in a more adequate manner than could the constant presence of one psychologist whose field of concentration limits him to a small number of aspects of the industrial situation; the variety of interests and capacities represented by an institute increases the possibilities of a satisfactory solution of any problem that business may call upon psychologists to solve.

In the English-speaking world four such organizations have been functioning, two of them still being active and the other two being either disbanded or absorbed into larger national organizations.

1. The earliest American organization was formed as part of the Carnegie Institute of Technology, and in 1915 was instituted under the direction of Dr. W. V. D. Bingham as a Division of Applied Psychology, later to be called the Division of Cooperative Research. Its purpose was to conduct researches in different types of business and industrial problems and to "apply the principles of psychology to commercial and industrial organizations." The different types of problems as they arose were studied under the direction of sub-bureaus: the Bureau of Salesmanship Research, which cooperated with 27 firms to study the general problem of the distribution of products; the Bureau of Personnel Research, under the direction of W. D. Scott and C. S. Yoakum, to study the essential qualities of salesmen; and the Research Bureau for Retail Training, under J. B. Miner and W. W. Charters, to develop techniques for the selection and training of salespeople, service employees, and minor executives. Some indication of the extent to which these bureaus served the public is indicated by the fact that by 1919, 30 corporations were affiliated with the Research Bureau for Retail Training, and 7 of the leading department stores in Pittsburgh were contributing $32,000 annually to the bureau to carry on investigations of methods of selecting and developing workers for about 900 positions in their organizations. By 1930 the same bureau, which had become affiliated with the University of Pittsburgh in 1922, had 9 members in its research and teaching staff, 15 research assistants, and 26 affiliated members.[1]

2. Another early development was the Scott Company, which was organized shortly after the First World War, and carried on a number of research investigations in a number of cities, devised a number of tests for different industries, introduced statistical methods for evaluating test results and workmen's performances, and was dissolved in 1923 because of the "conviction on the part of the directors that each business organization

[1] Craig, D. R., The Research Bureau for Retail Training, Its Work and Its Problem, *The Personnel Journal*, 10: 383–394, 1931; and News and Comments, *Jour. Applied Psychol.*, 3: 394, 1919.

should have, as part of its executive staff, one or more trained personnel workers, without whose presence the work instituted by outside organizations is of no avail." The increase in personnel workers in industry since that time is one of the most striking industrial developments.

3. The Psychological Corporation was organized in 1921 to act as a general clearinghouse for reliable information regarding the scope and possible applications of psychology and the location of psychologists who were qualified to render psychological services to business and industry. At first it conducted no research work in industrial organizations, but in 1922 the directors authorized the establishment of branches in any city having a director or three members of the American Psychological Association who were sufficiently interested in the work to devote part of their time to the applications of psychological principles to the needs of business, industry, or individuals; the scope and nature of the activity were left largely to the judgment of the individual members. Since that step was taken, the corporation has considerably broadened its activity, and under its sponsorship members have formed branch organizations in different centers,[1] and undertaken investigations in many types of business and industrial problems. The headquarters at 522 Fifth Avenue, New York, still serve as a clearinghouse for reliable information regarding the applications of psychology to various types of industrial and business problems. They include also a service division for rendering assistance to those seeking vocational guidance and those who are victims of maladjustments, a testing division for the publication and distribution of well-standardized tests, an industrial division for conducting researches in individual companies, a training division for prospective and promising industrial psychologists, and an advertising research division, which conducts national surveys four times annually and investigates the marketing problems of private organizations when its services are sought.

4. The National Institute of Industrial Psychology of the United Kingdom (N.I.I.P.) was organized as an outgrowth of the Industrial Fatigue Research Board, which was organized in 1915 to make broad surveys and investigations of industrial problems as they affect the welfare of the nation; a number of industries felt that much of the work of that board would be wasted unless there was another organization which could apply to individual firms the principles established by the Fatigue Board. The N.I.I.P. was established in 1921 to meet that need. Dr. C. S. Myers, Director of the Psychology Laboratory of the University of Cambridge, was appointed as director, and with him were a number of investigators appointed by him or borrowed from the Fatigue Research Board. The work of the institute has attracted more attention

[1] ACHILLES, PAUL S., The Role of the Psychological Corporation in Applied Psychology, *The American Journal of Psychology*, 50: 229–247.

than that of any other psychological organization, and has for some years been a center for research work for interested psychologists and engineers from all parts of the world. Its primary object is to serve industry. That is done only upon request. Its general method of investigation is to make a preliminary study, usually done in 2 days, of a problem which a particular industry has to solve, and to submit a report of the nature of the investigation that should be conducted (if any is justifiable), the probable cost and value of the study, and the general method of carrying on the study. The investigations are never for less than a 3 months' period, and quite often continue for 2 or more years. Some indication of the number and type of such surveys is shown in the fact that for the year 1937, 34 were conducted, 32 of which were completed.[1] The investigations, all of which were done under contract, can be classified into the following nine groups:

a. Lighting and atmospheric conditions, in three organizations: a bank, a clothing manufacturing concern, and a general engineering company.

b. Working conditions, in a chemical manufacturing concern and in a dyeing and cleaning establishment.

c. Factory and office layout, in a confectionery plant, an engineering plant, a mining-machine manufacturing company, a joinery manufacturing company, and a timber merchant's organization.

d. Centralized production control, in a cotton-spinning factory, a woolen-spinning factory, and a veneering plant.

e. Selection tests for employees, in a soap and food product manufacturing concern, a mail-order house, and a retail store (office workers), a manufacturing concern for paper sorters, and an engineering plant for selecting engineering apprentices.

f. Consumer research surveys, for a chain-store organization and for a food-product manufacturing concern.

g. A stock record system, for a hosiery factory.

h. Management methods, for an optical factory.

i. Teaching methods, for a commercial college.

In addition to these services to industry, the institute gave vocational guidance to 1,278 young people, directed the training program of students in several British universities, and supervised the study program of visitors from several European countries. Such investigations and training can be conducted, of course, only by trained experimentalists who are familiar, not only with the tools that are peculiar to psychology, but also with the related aspects of human nature problems as they affect the worker in his contacts with his job, his boss, and his environment.

PSYCHOLOGISTS' CONTRIBUTIONS TO BUSINESS AND INDUSTRY

The activities of individual psychologists and the services of psychological institutes represent the contribution that the science of

[1] Annual Report for the Year 1936–1937, *The Human Factor*, 11 (No. 12): 449–457, 1937.

psychology is making to the problems of business and industry. The center of psychological study is the individual; hence, the solutions that it provides for the troubles of business and industry are centered around the individual workman; the aspects of those relationships in which psychology has taken an interest and to which it has offered some contribution may be divided into the following six groups:

1. **Employing the Worker.**—This includes the problems of hiring and firing, job analysis and job evaluation, the use of trade and intelligence tests, and the introduction, follow-up, transfer, and promotion of the employee.

2. **Educating and Training the Employee.**—Psychologists have been concerned with the planning and directing of courses for executives, department heads, foremen, salesmen, and the rank and file of employees; organizing apprenticeship training courses, vestibule schools, part-time continuation schools, correspondence courses, and courses in local institutions; editing house organs, books of instruction regarding company policies, and bulletin-board notices; arranging educational clubs and excursions; building up a plant library; and counseling the operation of a suggestion system.

3. **Caring for the Health and Safety of the Worker.**—This has taken the form of preventive work by means of safety campaigns, physical examinations, and dental and optical clinics; remedial work in the form of medical care, first aid, and home and plant nursing; and research work for the purposes of eliminating accident causes, occupational hazards, inadequate lighting, heating, and ventilating conditions, and of introducing such measures—*e.g.*, appropriate rest periods—as will best conserve the physical integrity of the worker.

4. **Helping to Provide for the Economic Security of the Worker.**—The psychologist has had a share in this problem by studying unemployment trends in order to aid the stabilization of employment; by encouraging thrift and safety plans, cooperative purchasing and home ownership; by evaluating the effects of profit sharing, bonus payment, company-stock purchase, or any form of joint ownership plans; and by encouraging provision for life, health, and accident insurance, and helping to formulate adequate pension plans.

5. **Establishing Workable Employer-employee Relationships.**—By encouraging the introduction of shop councils, grievance committees, employee associations, and community organizations; by encouraging and directing surveys of employees' attitudes toward those phases of the work situation that affect them, and by recommending specific remedies for those situations that seem to be potential explosion centers; by evaluating such current practices as employee representation, collective bargaining, and the closed shop, which either employer or employee may sponsor,

the psychologist has been concerned not with the immediate effects of such instruments but with the contributions they can make to the morale of the organization and the permanent welfare of the employees.

6. Cooperating with the Advertising and Sales Forces.—By introducing improved selection methods, developing new selling and advertising techniques, and evaluating current and proposed methods, the psychologist has contributed more to these fields than he has to any other, and has been the most outstanding force responsible for changing techniques and elimination of waste.

Psychology has no short-cut method for remedying the ills of human nature. Its representatives are never found sponsoring speedy memory-training or personality-development programs. It follows the hard path of methodical investigation and research, and offers its solutions to those troubles of business and industry which it is in the position to diagnose and understand, only when it has patiently studied every variable that may affect the total situation. For many of industry's problems it has succeeded in finding solutions that work; to explain the nature of these solutions is the task of succeeding chapters.

Topics for Report

1. Make a list of the 10 most important problems that business and industry face today, to which psychology ought to be able to make some contribution. Arrange the problems in the order of their importance.

2. Select any five of the problems that Hepner found to be of importance for businessmen and give your solution. It is advised that the five that are selected be those that, in your judgment or experience, are the most important.

3. List those industries and business organizations in which psychological tests are being used, and describe the tests that are in use. Reports of industrial organizations with which you are, or become, familiar are preferred.

Required Readings

1. HEPNER, H. W.: *Psychology in Modern Business*, pp. 3–19, Prentice-Hall, Inc., New York, 1931.
2. MOORE, B. V., and G. W. HARTMANN: *Readings in Industrial Psychology*, pp. 1–8, D. Appleton-Century Company, Inc., New York, 1931.
3. VITELES, MORRIS: *Industrial Psychology*, pp. 40–56, W. W. Norton & Company, Inc., New York, 1932.

Supplementary Readings

1. MÜNSTERBERG, HUGO: *Psychology and Industrial Efficiency*, Houghton Mifflin Company, Boston, 1913.
2. POFFENBERGER, A. T.: *Applied Psychology*, pp. 3–18, D. Appleton-Century Company, Inc., New York, 1928.
3. HOLLINGWORTH, H. L., and A. T. POFFENBERGER: *Applied Psychology*, D. Appleton-Century Company, Inc., New York, 1917.

CHAPTER II

GETTING A JOB

IMPORTANCE OF GETTING THE RIGHT JOB

One of the most important factors in a person's life is the type of work that occupies the major part of his waking hours. Around that work and the contacts it provides will revolve one's standard of living, one's associates, one's leisure activities, one's entire mode of life. The job is the hub in the wheel of life, around which centers every other activity, and to which most of these activities should make a contribution. It will provide the most common topic of conversation, the most familiar field of knowledge, and the greatest object of one's loyalties and devotions; it should be the source of one's greatest enjoyment, the most worthwhile object of one's pride, and the opportunity for the best forms of self-expression.

Because it is of such importance, the selection of the job is a major problem—one which every person, certainly every male, has to face and solve. This decision may come at any time after a liberal education formally ends; it may be postponed until rather late in life, or it may be started in the late teens. It may be preceded by a long or short trial-and-error period, with considerable expense in time and energy to the seeker; it may be faced as a problem, undertaken as a study, and mastered as a subject before definite steps are taken to affiliate oneself with its possibilities; or it may be one of life's unsolved problems, and never mean anything to the person other than the financial returns it makes possible.

As a subject it is one that we tend to postpone or avoid, rather than systematically attack. The majority of us, faced with the craze for activity, the pressure of competitors' apparent success, the persuasive powers of parental counsel, and the eagerness to be independent, do not consider the ultimate values or responsibilities of our choice; in our eagerness to do things and get somewhere, we let any job, provided it gives fairly adequate returns and remotely vague possibilities, choose us. As a consequence, we are the victims of second, third, and fourth choices within the first year of working life. It is very true that the number of blind job catchers is diminishing; the dangers incident to just getting a job are so common a subject of conversation in both school and street that, with most beginners today, there must be at least one qualification—

the job must offer a chance to learn something. Whether that is a healthy or desirable qualification is doubtful; the eagerness to learn something, regardless of one's fitness for, keenness about, or possible contribution to the type of work one is familiar with has led to some of the most expensive of undertakings and to lifelong mistakes. Knowing something about a field in order to get somewhere in it is not nearly so important as other preliminary considerations, which should be weighed before the assimilative process starts.

Nothing can be a greater disillusionment to a person than to spend the greater part of his career assimilating the demands of an occupation, and probably making a so-called success of it, only to discover that every form of activity the job situation demands is to him a source of irritation and an unbearable load. The wailings of many a semisuccessful man who has spent a lifetime of sacrifice at his job, only to find that it is no longer a source of satisfaction or challenge to him, should give warning to those who have not yet started that the undertaking demands consideration from many angles. "You know my heart is not in the work," "I discovered late in life that I was a born teacher," "I should have been a research man, though, instead of a doctor" are typical of the self-discoveries that a lifetime of experiences helps some people to make. A job that gets one somewhere is not nearly so important in one's life as the job that gives one complete satisfaction—a happy mixture of satisfied ambitions, absorption in work, and complete self-expression.

THE WORLD OF WORK

To find the right employment for oneself it is necessary to know what the world has to offer. A comprehensive study of world opportunities is neither desirable nor possible. The field of one's possibilities is limited by the environment in which one lives or may live, by the capacities that one has for selected parts of that environment, and by the time and energy that one is prepared to expend in order that the demands of particular opportunities in that environment may be met. The boundaries of one's world of work are determined by the capacities of the individual as well as by the possibilities in the environment. Once these boundaries are set, the fields of study should be mastered first in a broad sense, covering national and probably international trends, and then in a narrow sense, covering environmental possibilities and training demands.

In making a study of an occupation, Kitson suggests[1] finding the answers to the following questions:

1. How many people in the United States are engaged in this occupation?
2. Where does the occupation rank in numerical importance as compared with other occupations?

[1] KITSON, H. D., *How to Find the Right Vocation*, pp. 42–43, Harper & Brothers, New York, 1929.

3. What are the leading subdivisions of the field?
4. What is the beginning job at which one can get a start in the occupation?
5. What is the next step to which I might be promoted?
6. What are the successive steps I would take on the way to the top?
7. What wages can I earn at the beginning job? At each of the successive steps?
8. What specialized training should I obtain in order to succeed in this occupation?
9. How long would it take to obtain the necessary training?
10. How much general education should I have before beginning the specialized training?
11. Where can I obtain the technical training required?
12. How much will it cost?
13. Does this vocation present any particular health hazards?
14. Is capital needed to start?
15. Does it require more intelligence than I possess?
16. What particular qualifications, physical or mental, should I have?
17. What is the nature of the work? Just what does the worker do? Does he manipulate things or people? Does he work outdoors or indoors? Fast or slow? What hours does he spend?
18. Is the employment generally steady or seasonal?
19. What are the particular objectionable features?
20. What are the special advantages, physical, social, or otherwise, in the occupation?

After such a survey as Kitson suggests has been made, there are other limiting factors that should be considered. One important factor is "the absorptive capacity of the occupation." Regardless of what skill a person may possess, unless he is very unusual, if the occupation is already overcrowded, gradually disappearing, or so circumscribed in its work that it has no related fields, there is a question whether one is justified in making preparation for it. Preparation for an occupation should be undertaken with due consideration for its likely possibilities 10, 15, or 20 years hence, rather than in terms of its immediate demands. The only way in which this can be done is by means of individual research in the occupations in which one is interested. Mr. K. R. Costigan recommends the following:[1]

Through research, list the industries, agricultural pursuits, and professions which seem to have the greatest possibilities of growth during the next 10 years. According to a survey made by the *New York Sun*, the following industries are actually employing more people today than in 1929: glass containers, fabrics, wearing apparel, paper, leather, printing and publishing, chemicals, beer and spirits, chain stores, retailing, insurance, and air transportation. To these we ought to add: air conditioning, electrical appliances, and sports. These are the industries that will need more trained men than in the present era—become an apprentice in such industries.

[1] COSTIGAN, K. R., How Uncle Sam Could Relieve Unemployment, *Review of Reviews*, December, 1936, pp. 36–37.

An interesting and more adequate study is reported by Ralph G. Hurlin.[1] As part of the work by the President's Research Committee on Social Trends, an examination was made of the census statistics for six decades. The changes in occupational trends during that period are

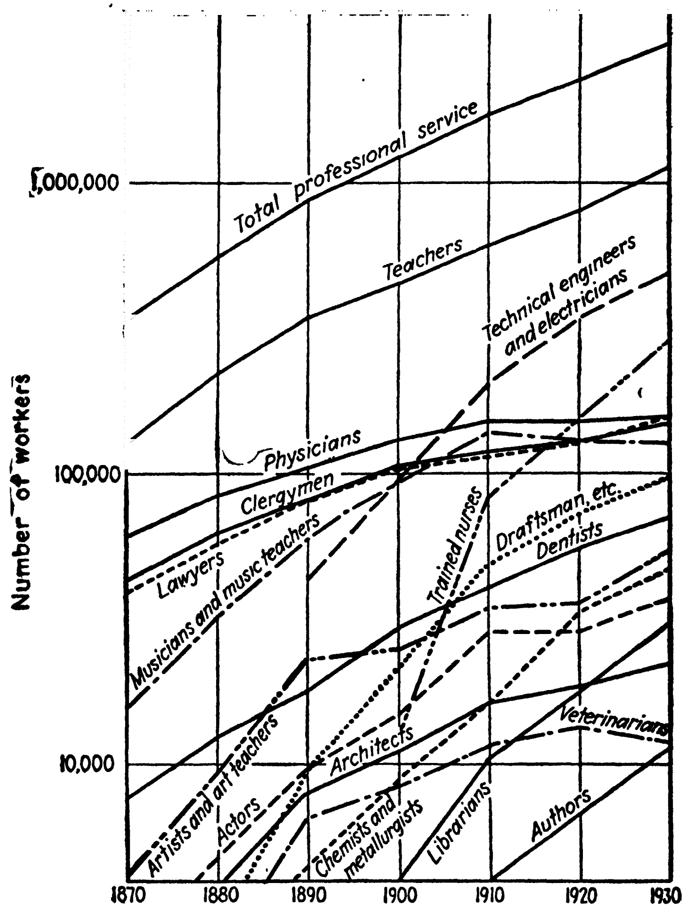


FIG. 2.—Growth of selected professional service groups, 1870 to 1930. (*After Hurlin.*)

indicative of professional and industrial growth, decline, or stagnation. The above chart indicates the changes in selected professional groups.

It will be noticed that, with the exception of clergymen, lawyers, physicians, and veterinarians, there has been a rapid increase in the number in each profession, particularly within the past decade.

Another study, reported by J. M. Brewer,[2] showed the changes between 1920 and 1930 in those occupations in which there were at least

[1] HURLIN, R. G., Occupational Changes from 1870 to 1930, *The Personnel Journal*, 11: 280–288, 1932–1933.

[2] BREWER, J. M., *Occupations*, pp. 6–10, Ginn and Company, Boston, 1936.

40,000 men and 10,000 women workers. The results were divided into five groups: (*a*) stable, in which the number of workers varied less than 5 per cent from the normal 16 per cent increase in those gainfully employed; (*b* and *c*) moderate increase or decrease, in which the variation was between 5 and 10 per cent; (*d* and *e*) great increase or decrease, in which the variation was more than 10 per cent. The number of occupational changes in each group is given in Table 3.

TABLE 3.—NUMBER OF OCCUPATIONS WITH SIGNIFICANT CHANGE BETWEEN 1920 AND 1930
(After Brewer)

Type of change	Number of occupations showing change	
	For men	For women
Remaining stable	6	9
Showing small increase	16	6
Showing great increase	32	23
Showing small decrease	11	11
Showing great decrease	36	15

The change in the number of workers in any one occupation in one decade, or even in six decades, is not a guarantee of the continuation of that trend. There are many factors that determine the possibilities in any occupation. Hall lists the following as the most important:[1]

a. The turnover rate within the occupation.
b. The number of workers dropping out of active work because of death, age, marriage, physical injuries, etc.
c. The number who are trained or who are in training.
d. The number who could transfer from one job to a related job with a minimum of special preparation.
e. The changes in consumer demand, in per capita wealth, in technological developments, and in population growth, as well as the migration of industries.

These might well be supplemented by other factors which affect occupational trends and which cause a large increase in the demand in one occupation and a correspondingly large decrease in others: governmental sponsorship of an unusual program, social innovations, new industries, and unusual discoveries are important factors that change the pattern of occupational trends from decade to decade.

Another factor that is important to evaluate is the possibility of changing from one phase of an occupation to another after a definite age limit has been reached. Although the issue has received major atten-

[1] HALL, O. M., How Occupational Trends Are Studied, *Occupations, The Vocational Guidance Magazine*, 12 (No. 6): 27–42, 1934.

tion lately, the factor of age and experience has always been an important one; in some occupations age and experience are definite handicaps: those occupations that require unusual manual skill or adventures into hazardous situations are closed to those who are much beyond middle age; other occupations do not permit easy transfer from one phase to another, unless unusual success has been attained in the field; some occupations are monopolized by youth, others by those who are past middle life. The selection of an occupation should be determined by its possibilities 10, 15, or 20 years after the person has made a start. An indication of the change during a 40-year period is given in the study made by Hurlin.[1] In Table 4 his findings are summarized.

TABLE 4.—PER CENT OF PEOPLE 45 YEARS OR OVER IN SELECTED OCCUPATIONS IN 1890, 1910, AND 1930, WITH PER CENT 16 TO 45 YEARS FOR 1930

Occupational group	Per cent 45 years or over			Per cent 16 to 45 years, 1930
	1890	1910	1930	
Clergymen, religious and welfare workers	46	45	51	49
Lawyers, abstractors, notaries, etc	38	41	44	56
Physicians and attendants	42	38	48	52
Dentists	28	23	36	64
Teachers	8	11	17	83
Architects	24	29	36	64
Musicians and teachers of music	14	16	26	74
Artists and teachers of art	18	25	27	73
Chemists and metallurgists	23	16	17	83
Photographers	19	24	33	67
Designers, draftsmen, and inventors	21	12	17	83
Bookkeepers and accountants	13	11	15	85
Stenographers and typists	1.9	1.6	3.4	96.6
Telephone, telegraph, and radio operators	3	5	9	91
Barbers, hairdressers, and manicurists	12	17	25	75
Salesmen and saleswomen in stores	10	15	21	79
Clerks in stores	....	9	14	86

The contrasts between the percentages in the last two columns indicate the vocations that primarily belong to youth and those which have increasing possibilities after age forty-five. The permanence of that trend depends upon the manner in which age affects skill and ability, and the effect that social legislation may have upon workers in the field.

In addition to national trends, one needs data showing the trends in the territory in which one prefers to work and the available workers in the particular industry and territory. Such studies are constantly being

[1] HURLIN, *op. cit.*, p. 285.

carried on, and the results are accessible for a considerable number of territories. Two reports that show trends and possibilities in two territories are given in the Tables 5 and 6. The Rhode Island report is taken from the decennial census of 1936, and the Springfield, Mass., report is taken from a survey that has been continuing under the Massachusetts Department of Education and The Springfield Trade School since 1932.

TABLE 5.—RHODE ISLAND SURVEY[1]

Industry	Number employed		Number unemployed		Per cent unemployed	
	Men	Women	Men	Women	Men	Women
Wholesale and retail	26,058	8,814	3,839	1,410	12.8	13.7
Woolen and worsted mills	14,836	11,312	2,334	1,510	10.7	11.8
Building construction	12,646	242	5,851	61	31.6	20.0
Domestic and personal service	11,439	14,139	2,097	2,223	15.5	13.6
Cotton mills	10,898	6,391	3,079	1,501	22.0	19.0
Machines and tools	8,042	568	1,250	39	13.5	7.0
Jewelry factories	7,929	5,402	2,099	1,385	20.9	21.5
Textile dye, print finish, bleach	7,410	1,038	590	82	7.6	7.3
Public service, city	6,815	4,350	1,176	239	15.0	5.2
Professional and semiprofessional	6,503	6,613	569	531	8.0	8.0
Farming	6,445	184	1,281	20	15.3	9.0
Other metal industries	4,869	1,005	685	113	12.3	10.0
Garages and filling stations	4,508	105	800	14	15.0	11.7
Silk mills	4,470	4,000	1,153	887	20.5	18.1
Express, trucking, bus, and cab companies	1,705	812	115	46	6.3	5.4

[1] The figures in Table 5 are taken from Table XV and Chart XIV, pp. 30–31, *The Rhode Island Population Census of* 1936, The Department of Labor, Providence, R. I.

With a percentage of unemployed trained workers ranging from 5.2 to 31.6, it is obvious that, unless one has unusual ability or special promise, the practice of most modern industries of hiring "old help" first is likely to be discouraging to a beginner. Most surveys will show 10 per cent unemployed, owing to temporary causes; but when there is a consistently high percentage, the prospects of gaining admission to the industry, at least in that particular territory, are very small.

The results from the Springfield survey[1] give an entirely different picture. The survey was made in the interests of an adequate training program, and many of the obvious needs have been remedied. Table 6 gives the results of surveys of four industries, with a varying number of

[1] Taken from *Surveys of Trades and Industries*, made by Mr. T. Morrison, The Trade School, Springfield, Mass., under the direction of the Division of Vocational

concerns in each industry. Column (I) gives the number of workers employed at the time of the survey; column (II) gives the likely available positions based on a normal labor turnover of 12½ per cent or on the estimates made by the surveyor, Mr. T. Morrison, of the number for

TABLE 6.—NUMBER OF WORKERS, ANNUAL OPENINGS, AND NUMBER IN TRAINING IN REPRESENTATIVE INDUSTRIES IN SPRINGFIELD, MASS.
(After Morrison)

Trade	(I) Number employed	(II) Openings	(III) Number in training
Machine trade, 1933			
Automatic screw machine	82	16	0
Drills—radial, drill presses	185	37	0
Grinders	118	24	7
Hand millers and milling-machine operatives	109	21	9
Lathe hands	123	25	23
Punch press operatives .	178	38	0
Printing industry, 1934:			
Presswork	376	61	5
Typesetting (all-round printers)	436	74	115
Bindery work . ..	219	47	0
Photoengraving ..	72	13	8
Lithography	68	11	1
Baking industry, 1936.			
All-round bakers, apprentices and helpers	166	29	10
Bread baking	263	54	1
Cake and pastry baking	257	51	4
Doughnut making	34	7	0
Routine salesmen, salesclerks	236	65	0
Woodworking industry, 1936			
Woodworkers requiring 3 or more years' training	299	49	75
Woodworkers requiring 2 years or less training	38	10	0

whom school or industry should provide training; column (III) gives the number in training.

In each case, in the machine trade, Morrison gives the number of possible workers in each branch of the industry, and computes the number who should be trained and the likely need when industry is operating

Education of the Massachusetts Department of Education, and in cooperation with The Federal Board for Vocational Education.

Part II, *The Machine Trade*, November, 1933, pp 7, 28, 29

Part III, *The Printing Industry*, September, 1934, pp 6, 22, 23.

Part IV, *The Baking Industry*, September, 1936, pp 6, 21

Part V, *The Woodworking Industry*, October, 1936, pp 6, 21.

at 100 per cent capacity. Such a study of the particular occupation or profession in which one is interested should be made for the territory in which one hopes to work, particularly if one has but average promise for the field of his choice. It has always been, and still is, true that, regardless of the crowded conditions of an occupation, if one has unusual ability for the work, or if one can find a section of the country in which the demand is greater than the supply, the chances of finding oneself are better than average. An already crowded field should be a deterrent to a person with average capacity, but not a necessary handicap to one with some worth-while ideas or with superior ability for the particular vocation.

Another limiting factor is the accessibility of the occupation. This ought to be studied from two angles:

a. The ease with which one can gain admission to the bottom of the ladder.

b. The number and nature of the organizations representing that occupation in the territory in which one wishes to work.

In both cases consideration must be given to local labor turnover, organization policy, training facilities within the organization for the particular type of work for which you think you can fit yourself, and community facilities for further extending your general training. The selection of a "place to work" means not only getting a job; it means, as well, the identification of yourself with the organization you join. It may mean the surrender of your individuality, your capacity for growth, and your standards of behavior to the keeping of an organization whose practices you may soon grow to despise. It must be remembered that not all firms have training programs, adequate or fair promotion systems, or methods of evaluating people; in many organizations very little attention is given to the beginner; he is a producer rather than an individual. A company's attitude and policy toward its younger workers should be known before making their tasks part of your life. Investigate them just as thoroughly as they investigate you before offering them your services and loyalties.

KNOWING ONESELF

Gaining an estimate of what the world has to offer is the smaller half of the task: abundant literature provides the material, and the only demand upon the seeker is that of assimilating it and gaining an estimate of the probable growth or decline in the demand for workers in a number of occupations or professions.

Gaining an estimate of oneself is a more difficult task; the proper study of mankind since time began has been *man*, and although progress has been made he still remains among the most complex and least understood entities. An analysis of the material components of man is moderately easy to make; an analysis of the immaterial components, the

potentialities, the capacities, the hopes, the desires, and the will to work, of man is still in the experimental stage; and in spite of unquestioned progress that has been made, there are aspects of human nature that defy analysis and prediction. Analysis can be made only in terms of past accomplishments and comparisons with others. One can compare himself with others of equal age and training, and from that comparison can form an estimate of the accomplishments that will likely be made in the future. Every job seeker ought to know how he compares with competitors. Success in life is partly determined by the "edge" that one has on others, the contribution that one can make over and above that possible by competitors. Failure in the field of one's endeavor is quite often the result of defeats by those who are more capable. The most important factors that will be decisive in determining that contribution are

1. Physical Equipment.—Knowledge of one's physical possibilities should not be limited to that gained from a physical examination. A sound body is now in the possession of a considerable percentage of beginners; but there are variations from person to person in the endurance that different parts of the body can maintain, and in the acuteness of sensitivity of corresponding parts of different bodies to impinging stimuli. The fatigability of various parts of the body; the ease with which small differences in tactual, visual, or auditory stimuli are sensed; the accuracy with which adjustments of corresponding parts of different bodies to varied strains, tensions, and pressures can be made—all ought to be known before one embarks on a career that may put undue pressure on a vital organ continually, when that organ may happen to be the weakest member of the body. The steady hand for surgical work, the unimpaired eye for constant microscopic work, and the sensitive ear for distinguishing variations in tones are but typical of functional differences that make for adequacy and efficiency or inadequacy and failure on the job.

2. Educational Equipment.—Entrance to the initial stages of most jobs today requires a minimum educational level. Competitors in the field will be one of the main determinants of one's promotional possibilities; the general educational level of the average worker for the job will partly determine the standards of the job and the contribution habitually made by those who have chosen it for their lifework. There are numerous fields in which a grade school education is an advantage over a high school; others in which a high school diploma is preferable to that of grade school or college; others in which college graduates comprise the bulk of the employees; and still others that are monopolized by graduate students of the better colleges. The fields available for those from the different educational levels determine the first boundary

of selection. It is true that there is considerable overlapping, and also that anyone from a particular educational level may take additional night school or correspondence-course work to fit himself with a broader educational background; that, however, is a problem to be faced after the map of progress has been laid out, and it will be determined by the ability and will to work of the individual. The start in one's selection must be limited by the attained educational level.

How valuable that level may be in indicating the type of work for which one is or may be fitted is doubtful; the educational curriculum makes it possible for any student to sample his capacities in only a very few fields, and the most that can be gained from that is an indication of types of work from which enjoyment has been gained and about which enthusiasm has been aroused. The student who periodically sacrifices time from sports or hobbies in the interest of a book on history, trigonometry, physics, or the manual arts, gives an indication of the "line" along which his enthusiasm or abilities may develop, but the certainty of that field as the logical choice is doubtful, because of the limited number of samplings that have been at his disposal. Selecting a career in accountancy because of a fondness for mathematics in high school is pinning one's faith and judgment on the satisfactions that one out of four or five fields of endeavor has brought, and gives no indication of one's possibilities in other fields. The educational level that has been attained serves as a limiting factor determining the available fields, rather than as a determinative factor aiding one's choice.

3. Mental or General Ability Level.—The capacity of a person may or may not be indicated by his level of educational achievement. Very often that has been cut short by economic and family considerations, or by a dilatory attitude toward schoolwork, or by one's eagerness to start doing something, and does not indicate the level that a person can reach. Whether one is capable of advancing beyond the attained educational grade or whether it would be wise for him to be contented with his attained level, he ought to know. An accurate estimate of that possibility is not easy to get. A consistently low C average in one grade ought to be an indication that the next higher grade will mean failure, but there are too many cases when the reverse has been the case.

As reliable an estimate as is available may be gained from mental tests, if they are used discriminately and with due regard to their likely error. Among those most widely used is the Terman revision of the Binet-Simon test. The difficulty with using it lies in securing a well-trained person to administer and interpret it; the objection against it is that it is of questionable value for the late teen age and ought to be supplemented with other evidence before its conclusions are accepted as final. Results from it are given in terms of I.Q.'s and mental ages.

When there is a close agreement between mental age and chronological age, as shown by I.Q.'s between 90 and 110, the likelihood of a person's reaching beyond the high school level is small. When the I.Q. runs well over 100, it is an indication that the pursuit of a higher educational level may justify the sacrifice. In the interest of one's future happiness, the general level of one's education might well be continued as far as capacities permit, before education in an intensive form in any special field is undertaken. The commonly accepted possible educational levels for corresponding I.Q. levels are given in Table 7.

TABLE 7.—POSSIBLE EDUCATIONAL LEVELS FOR CORRESPONDING I.Q. LEVELS

I.Q. Range	Level of Possible Educational Achievement
70–80	Grade school graduate
81–90	2d year high school
91–100	4th year high school
100–115	Junior college graduate
116–125	Senior college graduate
126 and up	College graduate work

Whatever results are gained from any one test should be corroborated before a final verdict is accepted. If preliminary results from the Binet test indicate that the person may belong to the college level, support or the reverse may be gained from the results from any one of such tests as the Army Alpha, the Otis Advanced, the Ohio State University Examination, the Thorndike Intelligence, or the Thurstone Psychological examination. If indications are that the high school diploma is the highest likely achievement, support may be gained from the Pressey Senior Classification test, the Otis Self-administering test, the Terman Group test, or from a much lower than average score in any of the tests open to college students. If the grade school is the threatened limit, corroboration may be gained from such tests as the Dearborn Group test, Series II.; General Examinations C and D; Haggerty Delta II.; the National Intelligence test; the Pressey Intermediate Classification test; or from a very low score on any test open to high school prospects. Probably the test most widely used and easiest to administer is the Army Alpha. As originally devised, it had five forms—numbered 5, 6, 7, 8, and 9—the directions and norms for all of which are identical, and the scores, because of the wide use of the test, more representative of the general population than those from most other tests. In addition there are numbers of revisions published, all of which have contributed to the validity of the technique. One set of results, given by Wilson and Hoke,[1] is representative of the scores made at different educational levels (and

[1] WILSON, G. M., and K. J. HOKE, *How to Measure*, pp. 597–598, The Macmillan Company, New York, 1929.

is reproduced in Table 8). It can readily be seen that a score below 75 throws some doubt on the wisdom of pursuing general education work beyond the 12th grade.

TABLE 8.—ALPHA SCORES AND HIGH SCHOOL GRADE LEVELS
(After Wilson and Hoke)

Letter grade	Range of scores for letter grade	Number of students attaining grade					
		Seniors	Juniors	Sophomores	Freshmen	8th	7th
A	135–212	29	25	17	8	3	
B	105–134	44	45	43	31	19	7
C+	75–104	23	26	34	46	44	35
C	45– 74	4	4	6	14	30	49
C−	25– 44				1	4	9
Average score made by each grade		120	117	111	97	88	70

How important general level of intelligence is in the selecting of one's lifework may be indicated by the scores made by individuals in different fields. Numbers of studies of the average general level required for different types of activity have been made, but there are wider ranges of scores from studies made using some form of the Army Alpha test than from any other. Table 9 gives the average scores made by representative workers in a variety of occupations.

TABLE 9.—AVERAGE ALPHA SCORES OF REPRESENTATIVE WORKERS

Class of worker	Score	Class of worker	Score
Accountant	117.9	Heavy truck chauffeurs	57.6
Auto chauffeur	64.7	Horse hostler	54.6
Auto assembler	68.1	Horseshoer	51.9
Auto engine mechanic	66.4	Horse trainer	56.6
Baker	58.7	Laborer	46.7
Band musician	81.9	Lathe hand	64.5
Barber	54.6	Laundryman	66.5
Bookkeeper	100.9	Locomotive engineer	64.0
Brakeman	63.0	Marine engineman	67.8
Bricklayer	57.9	Mechanical draftsman	114.0
Butcher	61.4	Mechanical engineer	109.7

However, the average or median score is only representative of the group of people working in a particular field; the range of scores made by all the workers in an occupation who have taken the test gives a better indication of the possibilities. Typical ranges of scores for a few occupations are given in Fig. 3.

A more recent grouping in terms of mental age levels is given in a study made by Douglas Fryer,[1] the results from which are given in Table 10, page 34.

Further data on the use that is being made of tests in industry and business today will be found in the chapters on tests. The beginner, however, before being subjected to these, should have access to the records available in most high schools today, which indicate at least the letter grade level to which he seems to belong.

4. Special Abilities.—A distinction should be made between the unusual abilities possessed by a small percentage of people and the above-average level of abilities in which many people share. It is not customary to find a person who ranks approximately the same in every

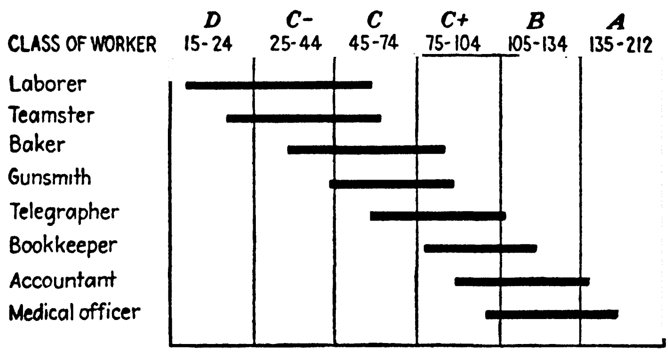


FIG. 3.—Ranges of Alpha scores among different occupations.

capacity. As a rule there will be one or two tests of abilities in which he scores considerably above average for the general group to which his scores on other tests indicate that he belongs. It is these above-average-for-level capacities which give him an edge on competitors and which he should understand before deciding on the contribution he will likely make to any organization. They indicate the type of work he will enjoy; any creative work that is to be done will be along the lines indicated by these capacities.

The difficulty lies in discovering the nature of the ability and the avenue through which it will find its best form of expression. Its nature is uncertain; it may be simple or complex, a unitary pattern manifesting itself in one field of activity, or a driving urge functioning in relation to one type of objective situation and displaying unusual capacity whenever that situation appears on the horizon; it may be measurable, especially if it is directed to one or two fairly common fields of activity, or it may be

[1] FRYER, D., and E. J. SPARLING, Intelligence and Occupational Adjustments, *Occupations*, 12 (No. 10): 56–57, 1933–1934.

TABLE 10.—CORRESPONDING INTELLIGENCE—ACHIEVEMENT VALUES
Possible achievement levels

Grade	M. A.	General	Educational	Occupational (Expected success as:)
A. Very superior	18 years and up	Creative and directive effort. High professional level	Superior work in university	Editor, lawyer, teacher, engineer, diplomat, minister, salesman (technical), statistician, accountant, executive (business)
B. Superior	16.5–17.9	Executive and business leadership. Professional level	Average college record	Writer, physician, grade teacher, insurance salesman, businessman, chemist, secretary, office manager, factory superintendent, draftsman, buyer, social worker, dentist, correspondent, minor executive
C+. High average	15.0–16.4	Minor executive. Abstract detailed and highly skilled mechanical worker	Secondary school and some college work	Stenographer, bookkeeper, nurse, clerk, salesman, small merchant, teacher (gym, music), photographer, telegrapher, R. R. conductor, musician, sign letterer, truckmaster, electrician, foreman, druggist, typist, clerk (shipping-express)
C. Average	13.0–14.9	Routine and skilled mechanical work. No complicated abstract detailed work	Elementary school and some high school work	The various kinds of skilled work. See scores ranging from 50 to 75 in Table 9, p. 34.
C−. Low average	11.0–12.9	Semiskilled worker	7th grade, maybe 8th grade	Hospital attendant, mason, lumberman, watchman, shoemaker, sailor, worker (steel, canvas, leather, textile, sheet metal), packer, fireman, porter, servant
D. Inferior	9.5–10.9	Simple routine work. Requires much supervision	4th grade	Fisherman, laborer (unskilled), loader, lifter
D−. Very inferior	7.0–9.4	Lowest unskilled occupational level	3d grade	Simplest kind of labor
E. Useless	0.0–6.9	Sometimes possible for high-grade imbeciles to do very simple routine tasks under careful supervision. Very little education possible. May do some manual work.		

incalculable and display its capacity in varying degrees, depending upon the appeal the situation gives.

TABLE 11.—SPECIAL ABILITIES AND RELATED OCCUPATIONS

Special abilities	Related occupations
1. *Verbal and linguistic:* fluency in the use of one's language and facility in learning other languages; perception of verbal relations	Author, lawyer, professor, minister, editor, advertising copy writer, etc.
2. *Scientific:* facility in defining, classifying, grasping principles, inductive reasoning, perceiving relation of rule to example	Research worker, physician, physicist, chemist, geologist, psychologist, etc.
3. *Clerical and commercial:* accuracy and speed in handling numbers, names, systems, and details	Bookkeeper, credit man, purchasing agent, cashier, clerk
4. *Mathematical:* facility with abstract symbols, and relations of cause and effect; perception of complex number relations	Mathematics teacher, accountant, statistician, engineer, comptroller, etc.
5. *Constructive and mechanical:* Perception of spatial relations; facility in designing, calculating, and working with machinery	Engineer, architect, inventor, toolmaker, printer
6. *Manual skills:* dexterity in using tools, skill with hands and fingers, precision in coordinating movements	Surgeon, dentist, sculptor, skilled mechanic, specially skilled trades
7. *Artistic:* appreciation of form and color; facility in crafts and imaginative interpretations.	Artist, sculptor, architect, designer, composer, actor, dancer, etc.
8. *Executive:* initiative, self-reliance, ambition, leadership	Director, manager, foreman, inspector, etc.
9. *Social:* social ability, cooperativeness, tact, personal pleasingness, helpfulness.	Politician, teacher, personnel or social welfare worker, salesman, etc.
10. *Practical:* efficiency in practical affairs, calmness under pressure, persistence, courage	Air pilot, sea captain, army officer, surgeon

Indications of its direction may be found in the special interests, undue absorptions, above-average accomplishments, and long-continued hobbies, the pursuit of which is a form of recreation rather than an imposed task. Tests for such capacities are not sufficiently well standardized in most fields to warrant undue reliance upon their results, and even when constructed they are centered around hypothetical entities rather than objective situations. These entities may express themselves *in toto* in one situation, but this is of rare occurrence; the more common type of experience demands the functioning of a pattern of abilities rather than the display of the strength of any one ability. The form

they may take ranges over the whole scale of human attributes; one will sometimes find unusual capacity for verbal work, sometimes for artistic, sometimes for mathematical; at times it may be an unusual capacity for steady muscular work; at times it may be in the indefinite field of personality, and display itself in the form of a quality that gives the person distinction. The important factor to know is what that asset is, and in what way it can be capitalized in the fields open to those who find themselves in the level of ability to which its possessor belongs.

Classifications of such special abilities are numerous; one of the most widely accepted is that suggested by Fryer and Sparling[1] and given in Table 11.

Such a classification is a guide rather than a determinant, and should be used as a starting point of further research into one's capacities; it should not be taken quite arbitrarily; there are many occupations that require a combination of a number of abilities, *e.g.*, sculptor is listed under both artistic and manual skills, architect under artistic and constructive-mechanical, and engineer under mathematical and constructive-mechanical. There are, also, many people with unusual ability in two or more fields, and numbers of positions require more than one ability—for example, a good dentist needs both manual skill and artistic ability; a good executive needs, in addition to social ability, either scientific or verbal ability or both; a good construction worker needs mathematical and mechanical ability. Fortunately, special abilities do not come in well-set patterns; they are but specially directed forms of mental energy that may readily be used to acquire unusual skill or facility in dealing with a special type of problem.

Evaluating these abilities is yet in the experimental stage; for some there are fairly well-standardized tests; for others there are no objective criteria by which their strength can be judged. Some suggestions are given in Table 12, but the results from none of them should be taken without corroborative evidence from other sources. Moreover, for many of them there are necessary personality qualifications that condition success to an even greater extent than does the possession of the special ability.

No tests should be selected without the advice of a psychologist who is thoroughly familiar with the latest developments; tests are standardized for different age levels and for different educational backgrounds; a safe selection can be made only when the test is known to have reliability and validity. The best available book on the subject is *Aptitudes and Aptitude Testing* by Walter Van Dyke Bingham, published by Harper & Brothers, New York, 1937. In it the chapter on one's special promise, as well as pages 273–380, should be consulted before any selection is made.

[1] *Ibid.*

All tests mentioned in Table 12 or in any part of the text may be secured from The Psychological Corporation, 522 Fifth Avenue, New York.

TABLE 12.—TESTS FOR SPECIAL ABILITIES

Special ability	Suggested tests
1. Verbal and linguistic	High score in such tests as Army Alpha, Otis, Bureau Test VI, Terman Group, or a good vocabulary test.
2. Scientific	The Stanford Scientific Aptitude Test, by D. L. Zyve, is widely used.
3. Mathematical	See *A Booklet of Norms and Reliability Coefficients*, issued annually by the Cooperative Test Service, 47 West 59th Street, New York.
4. Clerical and commercial	Minnesota Vocational Test for Clerical Workers; Thurstone Clerical Test; The N.I.I.P. Clerical Test, General Test for Stenographers and Typists, developed by the Research Division, U. S. Civil Service Commission.
5. Constructive and mechanical	Minnesota Mechanical Assembly Tests; MacQuarrie's Test for Mechanical Ability; O'Rourke's or Stenquist's Mechanical Aptitude Tests.
6. Manual skills	Minnesota Manual Dexterity Test; Johnson O'Connor's Finger and Tweezer Dexterity Tests; I. E. R. Assembly Test for Girls, a shortened form of which is H. A. Toop's Test, which has been revised by Emily T. Burr and Zaida Metcalfe.
7. Artistic	The Meier-Seashore Art Judgment Test; the McAdroy Art Test; and for Musical Ability, the Seashore Musical Tests.
8. Executive	Some personality tests have promise, but there is no test which can be depended upon. The best promise is with specially constructed rating scales.
9. Social	Moss's Social Relations Test has some promise, and Hepner has an amusing test; rating scales have the most promise.
10. Practical	Each test is specifically related to one type of situation. No general recommendation can be given.

5. Special Interests and Activities.—Additional knowledge of one's promise may be gained by listing the activities in which some part has been taken, the hobbies that have been cultivated, and the side-line interests about which considerable information has been acquired. No single one of these activities, hobbies, or interests is a sure indication of the field of choice, but each additional one serves as another index of the use that has been made of the opportunities in the environment, and of those aspects of one's surroundings that have been selected and

cultivated. Such interests indicate the factors in the environment that have aroused one's attention and in relation to which some energy has been expended. The part they play in determining the field of one's choice is shown by the amount of time and energy consumed in any field in which one is interested, and by the way that things in which one is interested bring forth an expression of maximum ability.

It is very true that one's expression of interest has to be taken with qualifications; interests are naturally limited by the opportunities afforded by the environment; in an impoverished environment a beginner is interested in every available novelty and every unusual occupation; and even in a fairly rich environment the less discriminating express an interest in every conceivable field of activity. It is, nonetheless, true that interests that are held for a long time and in relation to which a person expends considerable effort in acquiring information and skill play a determinative part in the type of work from which he will get the greatest amount of satisfaction. Deeply rooted interests may be suppressed, but they are not likely to be abolished, and they will continue to act as a drive conditioning the form of expression of one's desires.

The peculiar feature about our interests is that they are very rarely specific; they are not primarily concerned with a particular job or form of activity; instead, they are directed to certain types of work, which may appear in a number of forms; for example, an interest in the types of work a clergyman may be doing is closely related to an interest in those done by a Y.M.C.A. secretary, a social worker, or a clinical psychologist. The basic interest may find satisfactory expression in any of these fields, depending on other factors and qualities that condition success in each one. By the time the average person reaches maturity, he has built up patterns of interest the extent and intensity of which must be considered before selecting the field of his lifework.

There are many ways in which these patterns may be evaluated. The most widely used is the form suggested by E. K. Strong, Jr., of Stanford University.[1] Strong assumes that successful men in any occupation have a considerable number of interests in common, all of which contribute to their occupational success, and that the pattern of interests characteristic of one occupational group is not necessarily the same as that

[1] See the following publications by E. K. Strong, Jr., and Associates: An Interest Test for Personnel Managers, *Journal of Personnel Research*, 5: 194–203, 1926; Diagnostic Value of the Vocational Interest Test, *Educational Record*, 10: 59–68, 1929; Permanence of Interest of Adult Men, *Journal of Social Psychology*, 1: 152–159, 1930; Procedure for Scoring an Interest Test, *The Psychological Clinic*, 19: 63–72, 1930; *Vocational Interest Blank Manual*, Stanford University Press, Stanford University, Calif., 1930; Short Cuts to Scoring an Interest Test, *Jour. Applied Psychol.*, 16: 1–8, 1932; Efficiency Plus Economy in Scoring an Interest Test, *The Journal of Educational Psychology*, 26: 579–586, 1935.

characteristic of another group. Related occupations may have many interests in common, but even in these there are sufficient differences in the total pattern to make possible a differentiation between groups. If, then, the common interests of successful people in the different groups can be discovered, and a similar pattern is found in a person who has not yet chosen his occupation, the likelihood of his being successful in the field toward which his interests point is greater than is the promise for him in a field that is not related to his interests.

To get this pattern of commonalty of interests, Strong arranged a test in eight parts, each of which represented one aspect of a person's possible interests, and asked a representative group of successful men in over 300 occupations and professions to check their preferences in each group. Sufficient differences were found between some occupational groups to convince Strong that there is a definite pattern of interests characteristic of workers in each of these occupations, and that a similarity between any one of these and the expressed preferences of one who has not yet "found himself" would warrant an intensive study of the capacity of the person for the demands that particular occupation may impose upon him.

The difficulties with and objections against such tests are many. (*a*) They are time consuming to both the applicant and the administrator. Except in occasional cases where access to mechanical scoring systems is possible, immediate use of the results cannot be made. (*b*) They assume that an identity of interest pattern between those in the late teen or early twenty age and those engaged in a profession is an indication of a likely field for one to follow. Every person knows how fleeting interests are and how unusual it is for many interests to be held over a long period of time. If it were possible to compare the interest patterns of those in late adolescence with the patterns of professionals when they were of the same age, there might be some value in equating the results; to assume that because a young man of twenty has the same interest pattern as a man of fifty he should therefore follow the professional footsteps of the older man is to assume that interests of the present will be permanent. (*c*) From a collection of items of interest in the person's life the scales permit the construction of an interest pattern. The items represent the pattern. Why not make a direct attack upon the pattern and give the results in general terms instead of in terms of debatable specificities? It is obvious to most people that there are various and diverse fields of interests that are closely connected with fields of values; they may follow the separations suggested by Spranger and be grouped as theoretic, aesthetic, moral, social, political, and religious; or they may be in terms of some objective grouping. Thurstone has suggested that the patterns in 10 of Strong's professional groups

may be divided into four classes[1]—science, language, people, and business —and suggests that other basic factors may be responsible for identity of interests among members of different professions.

There is no question about the importance of interests in a person's life; the directions along which one's energy has been expended must be known; the important issue is the concentrated or expanding form in which the energy is being expressed. An interest in science may be a sign for continued interest and effort in its general aspects, rather than a hint that one phase of it should be the field of one's concentration; more important than the extent, or even the nature, of one's interests are the length of time that the interest has been maintained, the accomplishments to its credit, the sacrifices for which it has been responsible, the enthusiasms it has awakened, and the knowledge of goals it has enabled the person to attain. Interests that show coherence in their patterns and which have led to efficient accomplishments are aids along the highway of one's development, pointing the way in which energy is being directed and giving hints for further concentration. A knowledge of the nature of these patterns aids the counselor in selecting fields of activity for further efforts; time and experience alone can tell the specific form the pattern will or should take.

6. Personality.—No estimate of a person's promise would be adequate without an appreciation of that composite of qualities which is customarily included under the term personality. What personality is defies description. Its form of expression depends largely upon the acquisitions that endowment and training have made possible; its flexibility depends somewhat upon the varied types of experiences in which it has shared; and its constantly changing state is indicative of the fact that in personality—certainly during the time when one is faced with the problem of making a life's choice—there is a constant interplay of forces that are gradually shaping themselves in some definite direction. The end toward which these forces will tend depends upon a number of factors: the attitudes that have been acquired, the successes and failures that have been shared, the humiliating and disappointing and the exhilarating and conquering experiences that have formed landmarks in one's development, and the rewards or rebukes that others have contributed to one's gradually increasing stock of experiences.

When any estimate is being made of personality, it should be remembered that the end toward which forces tend is frequently vague, that forces are hypothetical entities about which but little is known, and that unforeseen experiences may effect a change in the direction in which these forces move and the effectiveness with which they cooperate.

[1] THURSTONE, L. L., A Multiple Factor Study of Vocational Interests, *Personnel Jour.*, 10: 198–205, 1931–1932.

Estimates are always in terms of past actions and present state; they are not assured indicators of future behavior. To assume that the future will be a continuation of the past, with those modifications and consolidations that time produces, is to assume a constancy of environment, a permanency of present values, and a stability of psychical patterns. The composite that is called personality is relatively fluid; its physical compound is subject to frequent change, and its psychical elements display such a variation and lack of constancy that estimates of their strength differ from person to person and from day to day.

Estimates that are made of personality are usually made in one of two ways:

a. By studying the past behavior and present state of the person.

b. By attempts to appraise the extent to which a person is likely to measure up to the demands of a particular situation.

With this latter we are not at present concerned. The former is of importance to the person about to offer himself and his services to an organization. What kind of person is he, and how can that be discovered? The knowledge of oneself gained from customary day-to-day comments is usually worthless; that gained from the reports of parents, teachers, or friends is nearly as faulty; that gained from self-estimates varies so much from time to time that unless there is some objective check, the estimates may go from the extreme of despair to the most optimistic heights. It is because of the unreliability of the customary available sources that some objective measure, checked by an impartial and unbiased observer, is essential.

First to be considered are the qualities or aspects of the personality about which an estimate is to be made. There is very little value in attempting to estimate moral qualities; they are not easily measurable and they vary so much in different situations that they cannot be estimated without consideration of the particular situation under which a person is placed. Moreover, it is generally assumed that home and school training have taken care of the development of those qualities; even if that is not so, today the guilty person in the position of employee is discovered fairly quickly and is speedily thrown among the moral lepers of the community. More important from the standpoint of one's occupation is the capacity one has acquired for working with others, the attitude one takes toward criticism, the persistence with which one sticks to a task, the thoroughness with which one does an assignment, the loyalty one has displayed toward other people or ideals, the capacity one has exhibited for shouldering responsibility, the fears one shares, and the successful adjustments one has succeeded in making. Estimating accomplishments in and capacities for these fields gives a valuable index

of one's likely capacity for meeting difficult situations when "on the job." During the past 10 years, ways of estimating some of these accomplishments and capacities have been developed, most of which one can get and score by oneself. The most commonly used so-called personality tests are

The Bernreuter Personality Inventory, Stanford University Press.
The Personal Audit (Adams), The Psychological Corporation, New York.
The Thurstone Personality Schedule, The University of Chicago Press.
The Humm—Wadsworth Temperament Scale, The Wadsworth-Humm Personnel Service, Los Angeles, Calif.
Revision of the Woodworth P. D. Sheet, S. D. House, C. H. Stoelting Company, Chicago.
The Hugh Bell Inventory (for adults), Stanford University.

One caution is necessary to those who will use any of these tests: they are all converted into statistical values, on the basis of which distribution curves are provided. Therein lies their possible danger. Each item on each scale is given a weighted value in terms of the whole scale, but the value in terms of the scale may be no indication of the importance of the item or the situation the item represents in the life of a person. One factor may play so important a part that it disturbs one's whole outlook on life. On this account, when the test is completed it should be reviewed by someone familiar with detecting the symptoms that are likely to be the source of trouble if they are not understood and removed.

Personality is the most important contribution anyone can carry to an organization. Most employment managers today assert that at least 60 per cent of one's likely contribution depends upon personality qualifications. For that reason they are constantly checking each employee on what are regarded as the most essential qualifications in the organization, the acquisition or possession of which is essential if a person is to hold what he gets. The qualities on which employees are evaluated vary from organization to organization; in some, emphasis will be placed on such characteristics as neatness, thoroughness, accuracy, carefulness, sense of responsibility, and capacity for loyalty to the organization; in others the major emphasis may be on such qualities as flexibility, versatility, promise of leadership, and curiosity. The variations in different places are determined by the major demands of the situation. A discussion of the customary method of evaluating these is found in a later chapter. This point should be noted: No organization tells its employees the particular personality characteristics on which major emphasis is placed, much less attempts to develop them in an employee; an occasional public-spirited personnel manager or foreman may take an unusual interest in a promising employee and point out the hidden rocks on which he will likely be wrecked, but the majority of employees have

to do some thinking in their own interests, discover the qualities regarded an essential and develop them, or move elsewhere.

MATCHING MEN AND JOBS

In order to make a proper start in the world of work, it is not enough to get a general estimate of its demands and of the capacities of the self; a much more difficult problem has to be solved, that of matching the two. A perfect marriage of individual capacities and work demands is as rare in the world of work relationships as it is in that of sex relationships. Ideals are rarely realized; most matchings are compromises, in which there is something that is distasteful on the one hand and that is not completely satisfied on the other. As it is only the rare marriage that is made in heaven, so it is only the rare person who can find the job in life that offers an opportunity for the expression of all his capacities, hopes, and desires.

In most sex marriages there are key demands that are crucial in the scale of values of the participants; to achieve a moderate degree of contentment these must be satisfied. They vary from person to person; social level, cultural background, financial security, physical attraction, exceptional capacity, and eagerness to please are among the crucial considerations that attract the sexes and that make matchings possible. Rarely are all of them present; the extent to which they are determining factors in the choice depends upon their individual importance in the scale of values of the participants. Some of them are essential in some cases, others in other cases; the additional factors are contributory adjuncts that enhance appreciation and loyalty.

In a similar manner the marriage that is made when a career is chosen is in terms of one or more of a number of basic interests, drives, and capacities; not all those that are present can be realized. For the marriage to be successful, those that are of most value to the individual must be satisfied, at the same time that the less important interests and abilities give a supplementary contribution to the object of one's choice, or find expression elsewhere. The extent to which such matchings can be made depends on a number of factors:

a. *The classes of occupations that are available.* Occupations are usually grouped into eight major classes: executive and administrative, professional, semiprofessional, clerical, craftsmen and skilled workers, domestic and service workers, semiskilled production workers, and unskilled physical laborers. Choices are rarely between widely separated classes; rather, they are between closely related classes or between divisions of any one class. Gradations of classes and the basic demands of the starting point in the gradation are more important factors for consideration than are widely separated classes.

b. *The extent to which relatively minor capacities contribute to one's major assets.* No one job or type of work demands merely the complete expression of one ability;

jobs have varied aspects and varied demands. The extent to which minor abilities and interests supplement the special ability determines the adequacy with which the incidental demands of the type of work can be met. Literary ability may be a person's forte, but that can rarely be matched with the demands of the world of work unless it is accompanied by an uncanny eye for details, a capacity for imparting one's knowledge to others, prodigious capacity for systematic work, social poise, or an unusual ability to give verbal, graphic, pantomime, or picturesque expression to ideas. The extent to which success attends any choice depends upon the degree to which the primary abilities that the field demands are supplemented by richness of endowment in related demands.

TABLE 13.—SELECTED OCCUPATIONAL REQUIREMENTS

(I) Abilities	(II) Personal qualities	(III) Occupations	(IV) Essential abilities and qualities	(V) Contributory abilities and qualities
1. Attend to details	*A*. Calmness when under pressure	Accountant	1, 3, 5, 13 F, K	9, 10, 12 C, E, I, J
2. Auditory acuity	*B*. Carefulness in making promises	College teacher	7, 8, 9, 12 C, D, G, M	1, 2, 4, 6, 11 E, F, H, I
3. Capacity to make accurate estimate of material factors	*C*. Dependability in discharging obligations	Correspondent	3, 6, 8, 9, 12 C, E, H, J, L	1, 2, 4, 7 A, D, F
4. Capacity to make good estimates of people	*D*. Directing the activities of others	Dentist	1, 10 C, J	3, 9, 12 A, F, K
5. Computational accuracy and speed	*E*. Getting cooperation of others	High school teacher	1, 4, 7, 11, 12 D, E, I, M	2, 9, 13 C, F, G, H, K
6. Creative capacity	*F*. Giving cooperation to others	Lawyer	3, 4, 7, 9, 11, 12 C, G, J, K, L	1, 2, 8 A, B, E, H
7. Facility and accuracy in oral expression	*G*. Helping others to solve personal problems	Medical doctor	1, 10, 12 A, G, K	2, 4 B, C, E, J
8. Facility and accuracy in verbal expression	*H*. Adventuresomeness in initiating and carrying through projects	Personnel worker	4, 7, 9 D, E, G	1, 3, 6, 8, 11 B, C, F, H
9. Logical reasoning	*I*. Loyalty to superiors and coworkers	Scientist	1, 6, 8, 9, 11, 12 C, H, J, M	3, 5, 13 A, D, E, I
10. Motor control and coordination	*J*. Perseverance	Secretary	1, 2, 5, 8, 10, 12 C, F, I	3, 4, 9, 11, 13 J, K
11. To direct and plan	*K*. Tactfully handling difficulties	Social worker	7, 9. 11, 12 C, D, E, J, K, L,	4, 8 A, B, I, M
12. To perceive essentials	*L*. Viewing others' problems impersonally	Supervisor	1, 3, 4, 9, 11, 12 B, D, E, I, K	2, 6, 7, 13 F, G, H, J, L
13. Visual acuity	*M*. Well-controlled and properly directed enthusiasm	University professor	1, 4, 6, 7, 8, 11, 12 D, G, H, J, M	2, 13 C, E, I, K

c. The individual capacity for preparation for the primary demands of the choice. Abilities and interests by themselves are no guarantee of success. Some of the most dismal failures have resulted from the beliefs that interest in a field is a guarantee of achievement, and that capacity to do a type of work is a guarantee that the work would be well done. There are two primary requisites for success: ability and the will to work. Mediocre ability when coupled with constant and sustained effort

frequently produces a higher level of success than superior ability that has been allowed to "waste its sweetness on the desert air" because of lack of application, the conviction of superiority, and the absence of well-formulated plans.

Some idea of the manner in which matchings may be made will be gained from Table 13. The first column contains some of the abilities that are expected of people in the executive, professional, and semiprofessional classes; the second column contains some personality qualities, the third lists 13 occupations, the fourth lists the essential abilities and qualities for the occupations, and the fifth contains some accessory qualities and abilities. It should not be assumed that these are the only qualities and abilities that are required; they represent the levels into which assets may be grouped and the issues to which major consideration should be given when a choice is being made. In each case the assets are expected to be above the average of the group of competitors; some indication of their presence may be gained from the manner in which they have have been expressed in both academic and nonacademic situations. Other indexes of their strength may be gained from well-constructed tests, rating scales, and objective self-analyses.

SOME HINTS FOR JOB HUNTERS

1. Study the "help wanted" advertisements in local and near-by city newspapers, and especially in the trade and professional journals published in the interests of the occupation you wish to follow.

2. Register with a reliable employment agency, but make sure that the agency deals with, and has a good entrée to, organizations that offer the type of work in which you are interested. An introduction to the agency by one of its old customers will help.

3. Accept the widely practiced habit of capitalizing on your friends and associates, particularly those who know your accomplishments in other fields.

4. Select at least a dozen concerns in which you would like to work, and file an application, after making sure that it is neatly written and completely filled out, with your telephone number. Then follow it up when you hear of vacancies within the organization. If your picture is asked for, send a full-face, not a profile, pose.

5. Find out (if you can) what the employment manager usually expects of and from applicants, and if you know you cannot measure up to his expectations, avoid the organization. Many employment managers do not hesitate to state what they expect from applicants, *e.g.*, Albert Jones[1] says there are only seven things he wants to know about a man:

[1] Reported by ALBERT E. WIGGAM, Seven Things I Want to Know about a Man, *American Magazine*, 113: 44–45, 111–112, 1932.

a. Is he on the way up?
b. Can he follow instructions?
c. Can he write a good letter?
d. Can he play ball (*i.e.*, cooperate with others)?
e. Can he talk clearly and forcibly?
f. Can he follow through—how long has he pursued his hobbies?
g. Will he keep physically fit?

What a particular manager will look for in many cases depends on his own experiences. Whatever he wants, try to find out before committing yourself to an interview.

6. If you cannot apply in person, write to a number of organizations, making sure that your letter is well written and states the particular qualities and training you have for the particular type of work you want to do. Don't apply for a job; apply for a particular kind of work, stating why you apply to the organization in question and why you wish that type of work. Mr. Babson makes some interesting suggestions regarding letters of application,[1] and gives some sample letters that have produced remarkable results. One of them is as follows:

JOHN JONES
14 Summer Street
Chicago, Illinois

The Boston Shoe Store
Chicago, Illinois
DEAR SIRS:

Last week I visited thirty Chicago stores and secured the prices at which twenty staple articles are being sold. May I call at your store and show my report to your employment manager? I know it will interest him. Please believe me that I am not representing, directly or indirectly, any store or manufacturer or advertising agency or anyone else. I am merely a kid, crazy about merchandising, and looking for a job in some honest store. I am 18 years of age, do not touch liquor in any form, and love to sell.

I can understand how railroads, factories, and offices must reduce help when there is no business, but how can there even be business until the stores sell merchandise? In this war against depression it seems as if we young fellows should be as glad to fight for thirty dollars per month as did our elder brothers twenty years ago in the war against oppression.

Please write when I may call and for whom I shall ask.

Respectfully,
JOHN JONES

7. Use your imagination. John R. Tunis gives the following account[2] of how one man secured the job of oil-burner salesman—the only successful one among 70 applicants:

[1] BABSON, ROGER W., *Finding a Job*, pp. 32–35, reprinted and published by permission of Fleming H. Revell Company, New York, publishers.

[2] TUNIS, J. R., Imagination Gets the Job, *The Saturday Evening Post*, January, 1935, pp. 41–42.

First he carefully studied the company's product. After learning all he could, he visited three friends who had installed the burner. Did they like it? Why? Then he questioned six more friends who had rival burners. After that he went to five people who still used coal. The results of his investigation he put into a report which stated that he had made a study to satisfy himself that the company's burner was the best, and that he could enthusiastically recommend and sell it. The report was passed around to every officer in the company. They unanimously voted to hire him.

Get some ideas about the product you wish to produce or sell, find out its valuable points, know something about the history of the organization, find out why it is that so many people call it their organization or company, and then present yourself at the employment office. The personnel manager of one of New York's largest department stores is quoted as saying:

It is the girl with the ideas who gets the job, the girl who has intelligence and interest enough to spend some time in the store looking around before she comes to me, who can suggest ways to improve our service, who at least will be able to say, "I watched the clerks and customers in the jewelry department yesterday, and believe I could sell in that line."

The personnel manager of one of New York's largest banks says: "Anyone with ideas is so refreshing that we look upon him as a potentially successful worker."

8. Look for a good job. Dr. Richard Cabot gives the following earmarks of one:[1]

a. Difficult and yet crude enough to call out your latent powers of mastery.
b. Variety balanced by sufficient monotony to meet your needs.
c. A good boss who takes an interest in you.
d. A chance to achieve.
e. A title and some recognition.
f. Connection with an organization which you can loyally serve.
g. Honorable and pleasant relations with comrades at work.

9. If you are a college student, you will likely be judged on the following points:

a. Your intelligent, orderly curiosity.
b. Your capacity for, and habits of, study.
c. Your ability to learn from, and cooperate with, others.
d. Your promise of ability to lead and influence others.

The organization will also be interested in what you did in addition to your studies, and how well you did what you were responsible for directing.

[1] CABOT, R. C., *What Men Live By*, pp. 27–28, Houghton Mifflin Company, Boston, 1914.

10. If you are granted an interview, note the following points:

a. Be natural.

b. Don't feel apologetic.

c. Be sincerely interested in what you are hoping to do. Don't question yourself as to the desirability of a type of work to which you have already committed yourself.

d. Candidly admit the things which you are not trained to do, in which the interviewer has an interest.

e. Inquire about the nature, but not the conditions, of the work you wish to do.

f. Many interviewers will present you with a typical problem. Don't rush to give an answer. Your jumping to conclusions furnishes your interviewer too strong a proof of your undesirability.

Topics for Report

1. Collect together as many records as are available of your educational history; supplement these with available scores on intelligence, aptitude, and interest tests; and evaluate your likely promise in terms of the type of work in which you are most interested.

2. Make a study of the type of work in which you are most interested: the number of people engaged in it in your state now and in the last decade, the qualifications usually required for the job, the available training centers, the cost of training, the possibilities of self-training through correspondence courses and night school, and the salary returns 2, 5, and 10 years after you start.

3. Interview at least three moderately successful workers in the type of work for which you think you can be fitted, and get all the information you think they are able to give you—the good and the bad. Summarize and report your findings.

Required Readings

1. BREWER, J. M.: Either *Education as Guidance*, pp. 178–226, The Macmillan Company, New York, 1932; or *Occupations*, pp. 470–488, Ginn and Company, Boston, 1936.
2. MYERS, G. E.: *Principles and Techniques of Vocational Guidance*, pp. 109–246, McGraw-Hill Book Company, Inc., New York, 1941.
3. HEPNER, H. W.: *Psychology Applied to Life and Work*, pp. 332–364, Prentice-Hall, Inc., New York, 1941.

Supplementary Readings

1. EARLE, F. M.: *Psychology and the Choice of a Career*, Methuen & Co., Ltd., London, 1933.
2. HOLLINGWORTH, H. L.: *Vocational Psychology*, D. Appleton-Century Company, Inc., New York, 1916.
3. BINGHAM, W. V. D.: *Aptitudes and Aptitude Testing*, pp. 1–205, Harper & Brothers, New York, 1937.
4. CRAWFORD, A. B., and S. H. CLEMENT: *The Choice of an Occupation*, The Department of Personnel Study, Yale University Press, New Haven, 1932.
5. WILLIAMSON, E. G.: *Students and Occupations*, Henry Holt and Company, Inc., New York, 1937.

CHAPTER III

THE IMPORTANCE OF PROPER SELECTION

THE RIGHT MAN IN THE RIGHT JOB

Getting a job is not nearly so important as getting the right job, getting a man is not nearly so important to the company as getting the right man. A mistake on the part of either is bound to be costly.

Importance of Proper Selection to the Worker.—The least noticeable and yet the greatest cost of improper selection is borne by the worker. The type of work that does not arouse interest and enthusiasm, and that does provide associates who are not liked, surroundings that are distasteful, and irritating situations that constantly recur, quickly reflects itself in slowness in mastering the job, carelessness or recklessness in performing it, and frequent lapses of attention when responsibility is the greatest. The result is a poor level of work, complaints from superiors, increasing number of accidents, excessive fatigue, and probable discharge.

Equally important is the disappointment because of failure to fit into a situation, an enhanced feeling of being misunderstood and undervalued, and a growing distaste for making further attempts at work adjustment. The temporary state of defeat reflects itself in discouragement and internal conflicts, which are very easily transferred to home and social situations and express themselves in the form of hopelessness and despair. The beginner who has changed jobs four times in one year is a ready candidate for the world of social misfits and can very easily become a member of the army of the maladjusted—maladjusted to self, to the world of work, and to social relationships. Depressions, feelings of fatigue, and the conviction that he is among the world's supply of the unwanted and undesirable are the frequent results. The habit of drifting, the loss of ambition, and the attitude of despair are normal consequents. As Münsterberg says:[1] "Social statistics show with an appalling clearness what a burden and what a danger to the social body is growing from the masses who do not succeed and who, by their lack of success, become discouraged and embittered." There is no wastefulness so far-reaching as that of misdirected human energy and activity.

Importance of Proper Selection to the Employer.—The type of worker admitted to an organization will be the main factor determining its morale. Whether he is cooperative or individualistic is a major con-

[1] MÜNSTERBERG, HUGO, *Psychology and Industrial Efficiency*, p. 35, Houghton Mifflin Company, Boston, 1913.

cern; whether he will with training be adequate to the job is of primary importance; whether he will be sufficiently stable and responsible to make personal sacrifices to be "on the job" is a necessary consideration; whether he will be flexible enough to adjust himself to different yet related types of work is a necessary discovery. A poor selection paves the way for inefficiency, waste, lost time, complaints, and ultimate discharge.

Some indication of its importance will be shown by the frequency with which the problem occurs. Table 14[1] gives the per cent of turnover rates in 144 industries for five representative periods, the monthly averages for 1937, 1938, and 1939, and the January averages for 1940 and 1941. The joint figures show an average separation rate of 3.7 per cent of the total working force, and an average accession rate of 4.14 per cent. The Department of Labor divides the "separation" group into three classes: "quit," *i.e.*, a termination of employment, generally initiated by the worker because of his desire to leave, but sometimes due to physical incapacity; "discharge," *i.e.*, a termination of employment at the will of the employer, with prejudice to the worker because of some fault on his part; "layoff," *i.e.*, a termination of employment at the will of the employer, without prejudice to the worker; this includes permanent layoffs, long layoffs, and indefinite layoffs. The "total separation" group includes the above three groups. "Accession" means the hiring of a new employee or the rehiring of an old employee.

TABLE 14.—MONTHLY LABOR TURNOVER RATES (PER 100 EMPLOYEES IN REPRESENTATIVE FACTORIES IN 144 INDUSTRIES

Type of rate	1937	1938	1939	January, 1940	January, 1941
Quit rate	1.25	.62	.79	.63	1.31
Discharge rate	.20	.11	.13	.14	.18
Layoff rate	2.98	3.37	2.22	2.55	1.61
Total separation	4.43	4.10	3.14	3.43	3.41
Total accession	3.55	3.85	4.07	3.74	5.44

Thus it will be seen that the average plant with 1,000 employees hires 42 men each month to replace those who have quit, been laid off, and been discharged. At a time when "accession" rate is greater than "separation" rate, there is an average of 37 men per 1,000 per month leaving the organization. The task of hiring and giving exit interviews to an average of 79 employees per month in a comparatively small organization is of major importance to the welfare of the organization. The number varies, of course, in different organizations and in different branches of the same concern.

[1] *Monthly Labor Review*, 46: 932, 1938; 48: 940, 1939; 50: 988, 1940; 52: 978, 1941.

The annual reports of the separation and accession rates in 20 different industries by the Department of Labor indicate wide variations in different industries and in the same industry in different years. Both the separation and the accession rates are seven to ten times as high in some industries as in others in any one year, and even in the same industry both the separation and the accession rates are two to three times as high in some years as they are in others. When the normal rate of exchange is disturbed because of other factors, the task of hiring becomes still more difficult. The average employment manager expects a turnover of from 8 to 15 per cent; but a sudden upswing in production, a succession of labor disturbances, or a dislocation of labor because of a national or local emergency increases that rate to unmanageable proportions. It is the presence of such disturbances that uproots well-planned selection programs, and makes it impossible for an employment manager to use many of the carefully established tools. This fact needs to be remembered when a selection method is being introduced; pressure of demand frequently makes it impossible to use many selection techniques that require individual administration. In times of emergency, group tests and the interview are the only sources of objective check in many places; when a one-man department is faced with the problem of making 40 or more selections before noon, the amount of time that can be spent on objective checks is reduced to a minimum.

The hiring problem is made still more complex because of the types of work for which men must be hired; some indication of the task that the employment manager faces will be gained if a study is made of Table 15.[1]

The 42 occupations that are listed in the first column differ in complexity, in level of skill required, in amount of responsibility, in social demands, and in the various other factors that should be considered if satisfactory selection is to be made. To make these selections properly the employment manager must be equipped with a knowledge of job requirements and the corresponding human abilities, and should have a battery of different objective measures for each different type of job; and to make the type of rapid adjustment that the new employee desires he must also know the personnel of the group with whom the entrant is to work and the social forces that are either weaving the group into a unitary pattern or are gradually splitting the members into comparatively isolated units.

THE COST OF LABOR TURNOVER

The size of labor turnover, including employees separating from and those joining the organization, is not of so much importance as is the

[1] Courtesy of T. O. Armstrong, Personnel Director, Westinghouse Electric and Manufacturing Company, East Springfield, Mass.

TABLE 15.—WORKERS HIRED FOR DIFFERENT TYPES OF WORK IN ONE ORGANIZATION

Classification	Number hired			Total workers
	July–Dec. '36	Jan.–June '37	Sept. '37	
Acid dippers	4	9	0	24
Assemblers	169	89	15	602
Babbitting machine operators	1	0	1	1
Bench hands	64	16	4	34
Boring mill operators	2	4	0	11
Boxmakers	1	9	0	12
Carpenters	4	2	2	13
Chippers	0	2	0	21
Clerks (filing)	37	23	1	45
Connectors	17	4	2	22
Cupola helpers	1	1	0	3
Diemakers	9	3	1	75
Dip- and bake-oven tenders	2	1	0	46
Draftsmen	10	1	1	12
Drill-press operators	51	36	4	156
Electricians	32	0	5	50
Grinders	16	8	0	235
Inspectors	74	41	9	191
Janitors	5	4	1	8
Laborers	16	16	0	110
Lappers	2	1	0	6
Lathe operators	34	27	7	74
Material handlers	47	38	6	61
Milling-machine operators	19	7	3	38
Millwrights	23	0	1	39
Packers	21	5	5	62
Painters (dip and spray)	16	7	3	50
Painters (nickel)	1	1	0	24
Polishers (rough and finish)	20	14	12	36
Punch-press operators	77	3	1	130
Repairmen (machines)	10	3	2	20
Screw machine (hand and automatic)	13	9	0	40
Solderers	3	21	1	70
Steamfitters	7	0	2	26
Store attendants	11	7	3	45
Testers	13	24	3	76
Tin dippers	1	1	0	9
Toolmakers	31	13	0	70
Truckers (hand and electric)	27	34	4	44
Washers (materials)	3	1	0	9
Welders	30	12	1	126
Winders	104	58	8	198

cost. That varies in different organizations and for the different types of positions in the same organization. *The Personnel Bulletin* reports[1], Mr. M. W. Alexander, President of the National Industrial Conference Board, as stating that every name added to the pay roll costs the company $35. The Dennison Manufacturing Company reports a cost of $80 before any new man is ready for average production. The Milwaukee Electric Railway and Lighting Company reports a cost of $217 for each new trainman. Mr. Alexander gives the data in Table 16,[2] in which the cost for preparing workers for five classes of work is itemized.

TABLE 16.—COST OF LABOR TURNOVER

Type of work	New employees						Old employees
	Hiring	Instruction	Wear and tear	Reduced product	Spoiled work	Total	Total
	$	$	$	$	$	$	$
Highly skilled...	.50	7.50	10.00	20.00	10.00	48.00	10.00
Skilled	.50	15.00	10.00	18.00	15.00	58.50	20.00
Semiskilled......	.50	20.00	10.00	33.00	10.00	73.50	35.00
Unskilled.......	.50	2.00	1.00	5.00		8 50	5.00
Clerical.........	.50	7.50	1.00	20.00		29.00	10.00
Average........	.50	10.40	6.40	19.20	7.00	43.00	16.00

Viteles quotes[3] a report of one employment manager who gave the following hiring and training costs per employee:

a. Inexperienced workers who have had no previous experience........ $239.00
b. Semiskilled workers with previous experience, but with no knowledge of the job to which they are assigned.................................. 190.00
c. Operators skilled in operations for which they have been hired; employees who are rehired; workers transferred from other factories.......... 24.00

Some estimate of hiring costs to employers will be gained if we take Fisher and Hanna's figures of the number of workers who change jobs annually, from 20 to 25 million, and multiply that by Alexander's rehiring costs, *i.e.*, the minimum estimate. Add to that the total influx of new material into industry annually, conservatively estimated as 2 million, with an estimated cost of $120 for hiring and training each person; and we have a minimum of 460 millions which industry spends annually securing its help. There seems to be some justification for Kornhauser

[1] *The Personnel Bulletin*, 6 (No. 5): 3, 1930.
[2] ALEXANDER, M. W.: Hiring and Firing: Its Economic Waste and How to Avoid It, *Ann. Amer. Acad. Pol. Soc. Sci.*, 65: 128–144, 1916.
[3] VITELES, MORRIS, *Industrial Psychology*, p. 116, W. W. Norton & Company, Inc., New York, 1932.

and Kingsbury's claim that labor turnover is one of the major causes of high living costs.[1]

The actual cost of hiring is, of course, much greater than the amount of money spent by the employment office; the increased liability of damage to equipment, the larger waste of material, and the greater accident hazard are as costly as the low production record and the expenses incidental to the maintaining of an employment office. In addition to these, the necessity for training will vary from job to job, and the amount of profitless training will vary with the age and the ability level of the worker.

The tendency of those in the late teen age to move from job to job, regardless of inducements offered them, and the inability of older workers to assimilate new types of work easily, increase the overhead expense and do not add to the efficiency of the organization. In support of the high labor turnover among the younger workers, C. S. Yoakum gives some statistics comparing the turnover rate of those below twenty years in comparison with those over twenty.[2] His figures show a turnover of 400 per cent for those between the ages of sixteen and twenty, against a turnover of 40 per cent for those over twenty

TABLE 17.—RELATION BETWEEN INTELLIGENCE AND LENGTH OF SERVICE

Test score range	Average length of service, days	Test score range	Average length of service, days
10–19	3	60–69	100
20–29	91	70–79	96
30–39	156	80–89	87
40–49	142	90 and over	35
50–59	107		

The irresponsibility and low intelligence level of some classes is another factor increasing the rate and cost. Employers of Negro labor report the necessity of a registered force of double the actual working staff in order to maintain a standard production level. Burtt reports a varying length of service with different intelligence levels.[3] Table 17 gives one report of the relation between intelligence and length of service.

[1] KORNHAUSER, A. W., and F. A. KINGSBURY, *Psychological Tests in Business*, p. 172, University of Chicago Press, Chicago, 1924.

[2] YOAKUM, C. S., Experimental Psychology and Personnel Problems, *Bulletin of the Taylor Society*, 10: 154–163, 1925.

[3] BURTT, H. E., *Employment Psychology*, p. 289, Houghton Mifflin Company, Boston, 1926.

HIRING METHODS

To find a way of reducing such expenses and eliminating as many of them as possible is one of industry's major problems. There are few fields in which so much guesswork has been done and so many haphazard methods have been used. Every ism that has been fostered has found its devotees in the employment offices of industrial and business organizations. Phrenology, palmistry, astrology, physiognomy, characterology, and especially the Katherine Blackford System, have all been given trial.[1] Inasmuch as, according to Griffiths,[2] one-half of the human race wants to believe in these pseudo sciences, it is to be expected that the business world would discover their futility only through experience. The fact that they have but a short term of use in any one organization and that year by year there is a decreasing number of organizations that will accept their claims is adequate proof of their futility. In 1925 Kornhauser and Jackson[3] sent questionnaires to 100 employment managers and 1,000 insurance agency managers, asking for their experience in the use of character-analysis systems. Ten per cent of those who replied admitted having used one of the systems. In 1936 a similar study was made under my direction among 200 concerns in Connecticut and western Massachusetts. Of the entire number, there were only two that admitted having tried one or more of the systems for a time, and no one admitted using them at the time of the inquiry or having any confidence in their results.

A much more common and equally invalid practice is in use, *viz.*, selecting one man to do the hiring and trusting his judgment and ingenuity for filling the vacancies satisfactorily. Quite often one person can and will develop satisfactory and moderately scientific tools as his aids, but more often the clues that he uses will vary from day to day, will be based on his own experiences or prejudices, and will be subject to the variations of his disposition and to his capacity for getting the worse side of an argument. Some go to the extremes of the one-legged monarch who, Link[4] says, describes his method as follows: "On Mondays I turns down all men with white collars, on Tuesdays all with blue eyes, Wednes-

[1] Adequate discussions and evaluations of these systems will be found in MOORE, B. V., and G. W. HARTMANN, *Readings in Industrial Psychology*, pp. 43–92, D. Appleton-Century Company, Inc., New York, 1931; VITELES, MORRIS, *The Science of Work*, pp. 98–124, W. W. Norton & Company, Inc., New York, 1934.

[2] GRIFFITHS, C. H., *Fundamentals of Vocational Psychology*, p. 51, The Macmillan Company, New York, 1924.

[3] KORNHAUSER, A. W., and A. W. JACKSON, A Note on the Extent to Which Systems of Character Analysis Are Used in the Business World, *Jour. Applied Psych.*, 6: 302, 1922.

[4] LINK, H. C., *Employment Psychology*, p. 14, The Macmillan Company, New York, 1920.

days all with black eyes. Redheaded men I never hires, and there do be days when I have a grouch and hires only every tenth man."

Other employment officers are equally sure of the accuracy of their selection when they, as Münsterberg says,[1]

> Consider it settled that for a particular kind of activity the Italians are the best, and for another the Irish, and for a third the Hungarians, and for a fourth the Russian Jews. But as soon as the factory secrets have been revealed, you may be surprised to find that in the next factory a decidedly different classification of the wage-earners is in force. In a gigantic manufacturing concern I received the definite information that the Swedish laborers are preferable whenever a steady eye is needed, and in another large factory on the same street I was assured that just the Swedes are unfit for such work. Sometimes this diversity of opinion is the result of different points of view. In one factory in which a certain industrial operation is rather dangerous, they told me that they took no Southern Europeans, especially no Italians and Greeks, because they are too hasty and careless in their movements, while they gladly filled the places with Irishmen. In a quite similar factory, on the other hand, they had a prejudice against the Irishmen alone for this work, because the Irish laborers were too willing to run a risk and to expose themselves to danger.

Equally common and fraught with as many dangers is the habit of depending on the recommendation of some one person or group of persons, some organization, bureau, or educational system, and accepting its judgment as final. Recommendations from minor executives or from people of social, political, or economic importance may or may not be of value. Quite often such statements come from people who know nothing about the particular job that the candidate is likely to fill and very little about the person recommended.

SOURCES OF LABOR

The adequacy of applicants for vacancies depends upon a great number of factors; one of the preliminary considerations is the "source of labor supply" that the applicant represents. The following list includes the customary "sources of labor" on which any organization must depend.

1. Transferring from One Department to Another.—This practice is fairly common, and because of the accessibility of the worker and the opportunity to give work to one who otherwise would be released, it is regarded as a fortunate solution of an immediately pressing problem.

When the job to which the person is being assigned is similar to the one in which he has been working, or when the worker is so versatile that he can readily adjust himself to new work and new surroundings, this

[1] Quoted by Morris Viteles, in *The Science of Work*, pp. 168–169, W. W. Norton & Company, New York, 1934.

solution is a convenient tool for stabilizing employment and maintaining company morale. It is also a satisfactory solution of unwise initial placements, and an easy form of adjustment for the otherwise capable worker who does not cooperate well with the particular personnel of one department. Often it is used as a means of acquainting promising workers with the demands of different departments and of maintaining interest in what otherwise would be boring and monotonous situations.

The objection to the practice is the difficulty of getting versatile workers' who readily change their habits of work and their work associates. Versatility is not commonly found among semiskilled workers. Trade experience and training have fitted them for one type of work; years of practice have consolidated their habit patterns; as a consequence, they do not wish a change and do not easily adjust themselves to the new demands of the new situation.

The same difficulty is experienced with younger workers. Securing steady and reliable workers among apprentices is not nearly so difficult as securing the versatile type of person, who can quickly assimilate the demands of different sorts of situations and adapt himself to varying kinds of work. In one study made of 80 apprentices at the Westinghouse Electric and Manufacturing Company, Springfield, Mass., the foremen reported, after 6 months' observation, that only eight of the group showed sufficient versatility to justify their being recommended for related types of work in other departments. Efficiency in one job is no guarantee of capacity to master another.

Another objection against sole reliance upon such a source is the limitation of choice that it puts upon the employment department. A careful selection would ordinarily necessitate interviewing from 15 to 20 candidates. By using only his transfer list, the employment manager has a maximum of five eligible candidates, and quite often fewer than that. Equally objectionable is the loss of the opportunity to introduce new blood into the organization, with the resulting possibilities for higher standards of work and for constructive suggestions.

2. Rehiring Former Employees.—An obligation to those who have worked with the organization is the common profession of employment managers. If the employee can return to his old job and the employment agent has kept a record of the candidate's work experience and knows enough of his qualities, his sickness and absence record, and his accident proneness, the rehiring of those who were released is the most reliable, economical, and satisfactory method of filling vacancies. It also helps to maintain company morale and build up public good will if the organization establishes and adheres to the practice.

Difficulties arise when workers for specific jobs are not available and when the old employees include only those whose experience has been in

unrelated types of work. Learning a new job or establishing a new pattern of movements is much more difficult for one who already has well-established habit patterns than it is for an apprentice. Regardless of the experimental discoveries of Thorndike and the extemporizing of Pitkin, the experience of those who are responsible for training factory workers is that their most difficult task, and their most discouraging one, is the retraining of "old" workers. To some extent this difficulty is avoided today. Some employment managers keep a record of the different types of work in their organizations that each employee has been trained to fill or in which he has had experience, and they replace old employees in one of these or in positions that are functionally closely related to them. The training for the new type of work is thus reduced to a minimum, and in a very short time the worker reaches the average production level. The fact that labor unions are demanding that old employees be rehired before new help is taken on makes the keeping of such a record a necessity today; without it, the problem of training the old worker in and for a new job is an urgent and difficult one.

3. Hiring Relatives and Friends of Those Already Employed.—The extent to which this source of supply is used is indicated in a study made by Burdge[1] of how 245,000 boys of late teen age secured their first jobs. Of these, 25.7 per cent reported getting their first jobs through friends.

The opportunity to get one's son or friend into the organization in which one is working fosters a spirit of gratefulness and loyalty on the part of employees, facilitates speed of hiring on the part of management, and usually tends to bring into the organization people who are reliable and trustworthy. Very few employees will imperil their own positions by taking the responsibility of recommending friends or relatives who are irresponsible or unreliable. The small percentage of employees who abuse the opportunity and recommend indiscriminately is easily discovered and barred from the privilege. The abuse of such a practice is much more serious when executives and officers, without sufficient regard for the responsibilities of the position, and with an eager eye only on the establishment of a relative in a secure position, recommend such persons for positions that subordinates have been eager to fill, for which they have spent some time in making preparation, and to which they have long been anticipating an entrée. The frequency with which that occurs is a common source of complaint among employees, and one that management is, in many cases today, bending over backward to rectify.

The difficulties with and objections to the practice of taking in relatives and friends are many.

a. Unless there are job standards which the friend is obliged to meet, and a system of evaluation through which he must pass, recommendations will increase in inverse

[1] BURDGE, H. G., *Our Boys*, p 194, J B. Lyons Company, Albany, 1921.

proportion to the exercising of discrimination, and bickerings and jealousies are inevitable. The fact that Jones succeeded in placing his son while Smith could not place his cannot be convincingly explained to Smith unless there are standards of measurement in terms of which objective results can be compared.

b. A large number of relatives in one division makes the task of supervision more difficult. An attempt to correct John's errors meets opposition, not only from John but also from his sponsor and his clique. Emotional attachments readily lead to excuses and to self- and other justifications, rather than to the attitude expressed by "let him stand on his own feet."

c. An equally serious situation can arise when promotions are in order. Unless objective criteria determine progress, promotions will have to be in a wholesale manner, instead of on the basis of individual merit. Interfamily jealousies extend their fangs into industrial relations and breed the suspicion of favoritism.

4. Advertisements.—Commonly placed in local newspapers, and less frequently in association magazines, advertisements are resorted to in times of emergency. Competition for skilled workers, especially toolmakers, is often severe; if no definite long-distance training program is a regular part of plant procedure, securing those who have been trained by others is the only solution. The advertisement is the acceptable medium for securing their services.

The value of this means depends upon the local supply and upon the reputation of the firm for fair play. Its disadvantages are many.

Unless the nature of the job is specified and the necessary qualities are stated, the applicants are likely to be of poor quality, and even if the statement is clearly made, the advertisement will bring in the floater and the casual worker. As a source of labor supply this is time consuming and expensive. O. R. Johnson gives some surprising results among the replies to an advertisement for salesmen that was inserted by a large concern in a widely distributed paper.[1] Out of the 11,988 applicants who answered the advertisement, 5,514 were given appointments; 4,736 of these kept the appointments, and from that group 517 men were hired. At the end of one year, 84 of those hired were making good. Only 0.7 per cent of those replying to the advertisement were profitable to the organization. A study by Burdge[2] of the ways in which 245,000 boys, ages sixteen to eighteen, got their first jobs showed equally disturbing results. In cities and villages with a population of 25,000 or less, only 0.6 per cent of the positions were secured by replying to advertisements. The undue expense and the difficulty of getting reliable information about the applicant in a short time destroy the value of local advertising, except for the more elementary types of work. Positions such as waitresses, knitting-machine operators, and typists can be filled rapidly from that

[1] JOHNSON, O. R., One Company's Experience in the Selection of Salesmen, *Administration*, 5: 646–658, 1923.

[2] BURDGE, *op. cit.*, p. 194.

source, for the examination procedure is fairly simple and speedy; but for those types that involve long training and a high degree of responsibility the results scarcely justify its use.

5. The Line at the Gate.—The motley crowd of hopefuls who daily stand in line at the gates of concerns with "Men Wanted" signs conspicuously appearing comprises nearly every variety of training and ability that human nature provides. To sift from these the desirable employees for the available jobs is a task that forces many an employment manager to resort to every trick of the trade he has ever used. The haphazard methods of choice confessed by some managers, without adequate knowledge of the man or the job, are offset in some rare cases by an orderly systematic procedure. Such statements as "He reminded me very much of one of our best workers," "I don't know why I hired him," "I hired him because I could not get rid of him" are but indications of easy ways out of embarrassing situations.

If the job is a fairly simple one, unskilled workers who are to be under constant supervision can be satisfactorily hired from this group, provided a skillful employment manager can make the best use of the 5 or 10 minutes that the interview provides. This source of supply presents a fortunate solution to companies with heavy seasonal demands, such as department stores and canning factories; an additional force of trained examiners and interviewers has access to a diminishing supply of workers, from among whom those who measure up to company standards can be selected with a minimum of expense.

6. Public Employment Agencies.—This source has recently provided an increasing number of workers—a situation due primarily to the fact that employment agencies are being sponsored by state and federal governments and by municipalities. Some advantages of this arrangement are that a fairly complete record of the work experience of the local unemployed is maintained and that the objection raised by workers against private agencies—the payment of a fee—is overcome. The value of such an agency to organizations depends upon the amount of knowledge of local positions that is kept in the filing system, and upon the capacity of the agents to weed out the unfit, classify the desirable, follow up individual cases, and check on personal reports. As they are a steady source of supply, these agencies can give speedy service and thus save the employment manager the task of collecting records.

Their weaknesses lie in their not meeting the above requirements, in their listing so many applicants that no one in the agency knows the records or the candidates well, in their lack of supply of specially trained workers, and in their keeping a cumbersome record system, which does not allow speedy access to the qualifications of different applicants for possible openings.

Private agencies, on the other hand, if limited to a special class of supply, *e.g.*, secretaries or accountants, depend for their survival upon the quality of those they recommend and are much more likely to give individual attention both to the candidate and to the nature and conditions of the job.

7. Fraternal and Welfare Organizations, Veterans' Bureaus, and Churches.—For certain types of workers, on whom the demand for frequent and wide contacts is placed, *e.g.*, salesmen and social workers, recommendations from these organizations may have some merit. A deficiency that they have in common—lack of knowledge of the job—is not peculiar to this source of supply; it characterizes nearly all sources. On the other hand, such organizations are more likely than many other sources to be familiar with the qualities of candidates.

The weakness of these groups as agencies of employment has its roots in their good intentions; charitable feelings are not the most satisfactory guarantee of successful production, and the helping hand, once extended, is likely to be stretched. Befriending another at the expense of, or without regard to, company standards is expensive to the concern, and is too likely to engender a submissively grateful attitude.

The effect on the morale of an organization is anything but constructive if a group from one denomination, bureau, or society dominates the social setting of a job, delegating to the rank of "outsiders" those not in or from the same clique. The so-called Protestant and Catholic school systems provide an object lesson for industry, and set forth with convincing clarity a situation fraught with too many dangers to encourage sponsoring.

8. Trade Unions and Professional Associations.—The increasing importance of these organizations to management today is, of course, due to the fight for the closed shop. The advantage of recommendations made by them is that the members are experienced in their particular trades and are quickly accessible. The work and life histories of their candidates are usually available, and when discrimination is exercised in the choice, satisfactory adjustment can be made speedily. Where they have placement bureaus and the members are arranged in rank order, *in terms of merit as tradesmen*, the recommendations are frequently reliable; where, on the other hand, there is a system of preferential treatment, recommendations are commonly given with sole regard to the desires of particular members and without any knowledge or consideration of job requirements.

With unions having established standards of age and experience as the most important determinants, adhering to company standards becomes increasingly difficult and can be maintained only when there is a rigid requirement that each entrant must meet before being employed.

An equally important factor in the case of workers from such sources is their strike experience and their attitude toward the company and toward nonmembers of their organization. Unless he weighs carefully the factors that may destroy company morale, a cooperative employment manager may easily admit to the organization a hot brick, which will burn the sides of fellow workers and ultimately disrupt the production schedule.

9. Schools and Colleges.—From these sources approximately 1½ millions are transferred annually to various parts of the business and industrial world (at least, as many as that hope to be transferred). This is the steady source of supply for apprentices and understudies. In general, the value of these institutions as sources consists in the broader training that their graduates bring to a firm. Whether that training should be specific or not is debatable. Should the taxpayer be put under obligation to provide funds for the training of secretaries, plumbers, or machinists for private organizations? There is as much justification for the school system's undertaking the preparation of beginners for every type of work the economic order provides as there is for its undertaking any particular type. The demand, in some quarters, for more specific training in the public schools and colleges, if pushed to the logical limit, would make out of the schools convenient adjuncts to business and industry. If preparation is to be had in school for one type of work, there is every reason why all taxpayers should be treated alike and why preparation should be available for whatever types of work the community offers to beginners. Fortunately, the eagerness that schools should take on this function has not received sufficient momentum to give it wide practice, with the result that in most cases schools still attempt to fulfill their primary function—the gradual unfolding and development of the entire person—and still leave the task of special preparation for business and industry to the forms of training that are gradually being introduced. The chapter on training will discuss this more fully.

The success of schools and colleges as a source of supply for labor depends upon unbiased appraisal of the student and exact knowledge of job requirements. With a moderately effective placement bureau in most educational systems now, and repeated checkups after a student has been placed, the recommendations from school systems are being given more weight than those from any other organizations. The tendency in some quarters is to give them too much weight. The employment manager of a large insurance company said to me in 1934, "I do not hesitate hiring any girl in this company if Mr. ______ of the ______ School recommends her." The fact of the matter is that teachers' knowledge of students is limited to their capacity to do the types of work the curriculum provides. Quite often that has no relation to the type

of work the job demands; on the contrary, excellence in some parts of academic work is a fair guarantee of inability to meet certain types of job requirements. The student who has developed successful skimming and reading habits has thereby unfitted himself for the position of proofreader, and will not make a reliable worker in any occupation of a verbal nature that requires close attention to minor details. Success in one type of academic work is a good preparation and recommendation for related types of work in the business world but is no indication of the value of the person in different types of work.

An equally important objection against this source of supply is the lack of familiarity on the part of educationalists with the particular qualities and abilities that special tasks in business and industry demand. The standard moral qualities on which emphasis is most commonly placed by the educationalist are of secondary importance, in the hiring a worker, to such qualities as versatility, sense of responsibility, resourcefulness, and capacity for cooperative effort when under pressure.

Cooperation is possible between education and industry, especially when industry is more specific in its descriptions of the main requirements of available positions and when educationalists are more objective in their evaluation of each candidate's qualifications for the demands of a particular job than is commonly the case.

10. Letters of Application.—As a source of supply today, letters of application are much more likely to be an irritant than to be the means of introducing a worker to an organization. Frowned upon by both employment manager and research worker, they have lost their effectiveness, and are rarely used except for the more advanced positions. The reason is not difficult to discover. Such letters are usually received by one person, who may or may not read them and who, at the best, will select one or two that seem to him to represent the desirable applicants; his selection is often determined by the general style of the letter, the choice of paper, the handwriting, the marginal and line spacing, the neatness and manner of expression, and the completeness of the content, especially with respect to previous training, interest in work, and reasons for applying for the position. Their value, as estimated by any or all of these criteria, depends upon the capacity of the judge to estimate the desirable qualities that he thinks the letter discloses.

Two studies have been made, which give disconcerting results. Walton secured 25 letters of application for a position as bookkeeper,[1] and asked 50 business and professional men to judge them for their intelligence, tact, reliability, and neatness. After an interval of 6 months she asked the same judges to arrange the letters in order of merit

[1] LILLIAN C. WALTON in H. L. HOLLINGWORTH'S, *Judging Human Character*, pp. 12–20, D. Appleton-Century Company, Inc., New York, 1922.

again on the basis of each of the four traits. Consistency of judgment was much better than chance, the correlations ranging from .473 to .6, but the variations in judgments were great, correlations for the different judges ranging from .08 to .91. One interesting result was noticed, *viz.*, the tendency to rate all the traits together; if a candidate had been judged as high or average in intelligence, the other traits were generally placed in the same or in adjoining groups.

Poffenberger and Vartarian[1] gave 25 applications, from members of a senior class in a training school for religious workers, to 12 members of the staff of Union Theological Seminary, and had the applications arranged in order according to the degree to which they indicated general ability, intelligence, and tact. The results were compared with teachers' ratings and associates' judgments. The results are given in Table 18.

TABLE 18.—CORRELATIONS BETWEEN JUDGMENTS FROM LETTERS AND FROM RATINGS BY TEACHERS AND ASSOCIATES

Trait	Teachers' judgments	Associates' judgments
General ability..........	.56	.46
Intelligence.............	.58	.44
Tact....................	.20	.18

The results from both these studies do not indicate that letters of application offer enough clues to the ability level of the candidate or to his character qualities to justify management's placing much confidence in them. They may have some value when the letter shows unusual ability or industry on the part of the applicant.

A modification of the personal letter of application, in the form of a letter of introduction, has gained momentum in recent years; as practiced by educationalists in the interests of promising students and by employment managers in the interests of capable employees who are about to be released, it has twofold value: it ensures the sponsorship of an experienced person and it directs the inquiry into channels that will be appropriately suited to the abilities and interests of the candidate. The dangers to which unlimited use of this channel are exposed are obvious: emotional sponsorship because of need, indiscriminate correspondence without any knowledge of job conditions, and the abuse of acquaintances in the interests of the incapable.

11. Miscellaneous Sources of Supply.

a. Office appliance companies, *e.g.*, typewriter, comptometer, and accounting machine manufacturers, which maintain employment bureaus

[1] HOLLINGWORTH, *op. cit.*, pp. 20–23. See also pp. 23–32 for other reports.

to supply skilled operators to their customers can generally be depended upon to offer satisfactory help.

b. Hospitals and penal institutions are patronized by some organizations, chiefly by those interested in old employees and in undertaking a small amount of reform or missionary work.

c. Scouting among rural districts, foreign-language groups, recent immigrants, and boarding houses is occasionally resorted to when there is an extreme shortage of labor; this practice takes on many forms in times of emergency—local surveys of available labor, transferring of women to jobs previously filled by men, and attempts at wholesale temporary importation of unskilled labor.

d. Previous applicants and part-time employees about whom considerable information had been gained at an earlier period, but who had to be rejected or temporarily discharged, may be reconsidered. Except in times of extreme depression the former of these sources is disconcerting —those who impress an employment manager favorably have frequently been located in other organizations— while the latter can often be changed from a temporary to a permanent status.

It must be realized that the selection of one or more of the sources of supply is but the beginning of the hiring task. Too often the mistake is made of depending upon one or two of these sources alone for the supply, and of accepting their recommendations without making any further study of either the candidate or the position he is likely to fill. Adequate selection is possible only when the department making the choice

a. Knows the job, its physical and mental demands, and its social setting.

b. Has established standards which candidates for the position must meet in order to be eligible.

c. Has adequate tools for evaluating candidates, so that the choice may be made in such a way that the selection will be neither better nor worse than the job demands.

The following two chapters will describe the best available methods in use today.

Topics for Report

1. Select any five of the types of work given in Table 15 and describe the functions of each type and the qualifications you think necessary for doing them.
2. List completely the methods of hiring used in three of the places with which you are familiar.
3. Make a study of the labor turnover rate in any one organization for a 5-year period.

Required Readings

1. MOORE, B. V., and G. W. HARTMANN: *Readings in Industrial Psychology*, pp. 43–92, D. Appleton-Century Company, Inc., New York, 1931.
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CHAPTER IV

HIRING THE WORKER

The one man known by every worker in an organization is the employment manager. He may or may not be the personnel manager; quite often he is an officer in the industrial relations department; to the job hunter he is the most important man in the organization. Because of his conspicuous position and the infinite variety of contacts he makes, he should have at least two qualifications for the position:

a. He should know the jobs, or have ready access to detailed descriptions of each job in its entire setting.

b. He should know the pitfalls and tools of importance in estimating human capacities.

He should be able readily to adjust himself to any type of candidate, be so disposed that he elicits the honest efforts and sincere cooperation of every applicant, be so interested in the welfare of others that he readily gains their confidence and respect; and yet be so governed by standards that he does not hesitate to reject any applicant, no matter what his connections, who fails to measure up to standard requirements. His task, if improperly executed, results in an unfavorable public attitude toward the organization, high labor turnover, undue training expense and effort, and repeated labor troubles. If, on the other hand, his work is properly done, he can reduce labor turnover to a minimum, establish the preliminary steps in the fostering of good morale, and provide for the employees a trusted and confidential friend to whom they can turn in emergencies.

THE TASK OF HIRING

The task of hiring is by no means so simple as it seems to the applicant. Uhrbrock[1] lists the following nine steps in selection procedure. The realization of their importance will give some conception of the employment manager's task.

1. Reception of Applicants.—The first impression an applicant gets of an organization is given him in this preliminary contact. The question whether or not it is going to be a desirable place to work in will be answered by many during these few brief moments. For that reason,

[1] UHRBROCK, R. S., Mental Alertness Tests as Aids in Selecting Employees, *Personnel*, 12 (No. 4): 229–237, 1936.

provision should be made for a reception in keeping with the spirit of the organization. There should be a comfortable waiting room, supplied with appropriate reading matter—particularly company magazines—proper lighting, smoking facilities, and an agreeable attendant ready to answer reasonable inquiries.

2. Preliminary Interview.—This step usually is of short duration and primarily for the sake of giving an employment manager an opportunity to decide whether or not the applicant should stop at this stage or continue to the next step in a progressively delimiting series. From this interview the manager can decide whether or not the applicant is obviously unfit for the job, or would probably be personally objectionable to his associates. If the applicant is a self-assured, obviously self-important college graduate and the others in the office are girls with high and commercial school training, there is no further reason why succeeding steps in the selection procedure should be used.

3. Completing the Application Blank.—This may be done with or without the supervision of an officer or of one of his assistants. The customary policy is to let the candidate dig his own grave. The uncompleted items and unsatisfactory personal data are sufficient justification for ending the procedure at this stage.

4. Administering Employment Tests.—These tests, which are becoming increasingly common, are given in either standardized objective or oral form. Management must know how adequately prepared for a position a candidate is; the testing procedure in the form of trade questions from the foreman, or objective tests administered in the testing department, serves to show how well the candidate compares with the average employee in the particular position and eliminates those whose lack of familiarity with the job requirements makes further examination unnecessary.

5. The Interview.—This is the most important, and in some cases the only, part of the selection procedure. With data supplied by the application form and the testing department (if these have been used), the officer is in a position to estimate the applicant's technical fitness for the job. However, he knows nothing about the applicant's attitudes, motives, character traits, or cooperative capacities. The interview helps him to decide whether or not he should further continue his investigation.

6. Investigation of Previous History.—By inquiring from past employers and by checking the items of information given in the application blank, the manager gains some information regarding the qualities the applicant possesses that are of importance on the job. An unfavorable work or character history, or definite evidence of qualities that are regarded as undesirable for the position, serves as another delimiting factor. On the other hand, if these points are favorable, the candidate is

either grouped in the waiting list of desirable applicants or given preliminary selection.

7. Preliminary Selection.—The first selection is usually a tryout and may continue for a week or more at different types of work in one department or more before reaching the next stage.

8. Final Selection.—With the approval of the foreman or supervisor, the applicant is given a definite place to work, definite instructions to follow, and a person under whose guidance he is to receive his training.

9. Physical Examination.—This examination may precede or succeed placement; if it succeeds placement, the appointment is usually conditioned upon the applicant's meeting the required physical standards. Such examinations are being used in many organizations now for a number of reasons. The most important, listed by Mr. E. B. Lawton. Assistant General Manager of R. H. Macy & Company,[1] are

a. To prevent unjustifiable claims for compensation in cases in which conditions existed prior to employment.

b. To reduce employment, training, and production expense through the selection of applicants physically fitted for the work.

c. To prevent prolonged disability or illness by early discovery of symptoms.

d. To reduce absence rate because of fatigue.

e. To protect fellow workers and customers against infectious disease.

f. To enable management to place applicants in the type of work which they can easily perform.

g. To locate any weakness which may impair the candidate's health and reduce his earning capacity.

The modern employment manager, confronted with the problem of devising appropriate application forms, standardizing discriminating tests, conducting judicial interviews, and evaluating the relative importance of each item in the total picture presented by his candidates, has a task the solution of which is dependent upon

a. His knowledge of human nature.

b. His technical knowledge, which is determined by the operations carried on in the organization.

c. His capacity for matching *a* and *b*.

The primary concern of the psychologist is with the "human-nature" knowledge that should be at the disposal of the employment manager. The tools he uses, or should use, have been the experimental play toys of psychologists for the past 20 years, and the technique he adopts—or should adopt—has been evolved through repeated and painstaking investigations. The particular nature of these contributions will be discussed in this chapter and those following.

[1] LAWTON, E. B., Physical Examinations in Industry, *Industrial Medicine*, 5: 547, October, 1935.

THE APPLICATION BLANK

For approximately 89 per cent[1] of the positions available today the completion of some form of application blank is required. In the great majority of cases the blank is completed by the applicant without any assistance; in some cases it is completed by the interviewer, who uses the manner and content of the responses as a guide to his estimate of the personality of the applicant. When the blank is completed independently, the items asked for in it are checked up later, and serve as one basis for estimating the applicant's honesty, carefulness in filling in required details and consequent thoroughness on the job, and his ability to recall such of his experiences as previous salaries, employment dates, reasons for leaving other places of employment, etc. Among the numerous justifications for its constant use, the most commonly offered are the following:

a. It is a good testing device, provided that the application card is properly designed.

b. The handwriting and spelling are useful guides in estimating the capacity of the candidate for some positions.

c. If a record is made of the time taken by the applicant to complete the form, it serves as a general index of his ability to complete things quickly.

d. When a number of applicants are waiting to be interviewed, the monotony of the waiting period is broken by using some of the time on filling in the form.

e. A keen and experienced interviewer will form some valuable general impressions of the applicant by watching him closely while he is filling in the blank.

f. An interviewer has a chance to study the applicant before meeting him.

g. The applicant has an opportunity to study questions and give a more intelligent answer than he might if asked for the same information in an interview.

The information asked for in an application form varies, from the type that includes previous experience and training, together with a very few personal items, to the type that asks for nearly everything about an applicant's past, present, and likely future—affiliations, attitudes, interests, preferences, and contacts, as well as personal and work history. Frankel and Fleisher in a survey of the contents of application forms[2] report that over 50 per cent asked for 16 different types of information, the greater part of which had no relation to the particular type of work for which the person was applying. The more inclusive application blank has been the product of fertile personnel managers. The fuller they wish to have the records that they keep, the more they tend to collect whatever information will likely be necessary, and to gather it in the easiest way, *i.e.*, by the signed statement of the applicant.

[1] CRAIG, D. R., An Analysis of Personnel Forms, *Industrial Management*, 70: 122–124, 1925.

[2] FRANKEL, L. K., and A. FLEISHER, *The Human Factor in Industry*, p. 50, The Macmillan Company, New York, 1920.

In his "model" application blank for hiring life insurance salesmen, Bingham[1] lists 24 items and includes among them such information as a full account of how your time has been spent since leaving school; what your immediate family thinks of selling life insurance; how many times during the past year you have taken part in such sports as handball, horseback riding, boating, etc. Whether all these items are of value or not, whether the answers to them can be taken at face value or not, what purposes some of the answers serve, and why an applicant has to tell everything about his social, economic, and spiritual existence in order to get a job that barely keeps him off the bread line is often a little puzzling to him, and sometimes is used as an open invitation to deception. Illustrations of such a practice abound. In the Army the personnel department found that only 6 per cent of those who claimed they were skilled in a given trade were really skilled enough to stand up on the job, and over 30 per cent were totally inexperienced. In the annual report of the U. S. Civil Service Commission for the year ending June 30, 1923, out of 229,640 people applying for positions, 835 were barred because of attempts to deceive the commission. In one department in New York City there were 8,446 applications for positions in one year; all the applicants swore that they had no criminal record. Fingerprint experts found 181 of them in the criminal-record files in Washington.

There is no doubt that if all applicants are asked too many personal questions there will be a considerable percentage who will refuse to give the correct information or will deliberately distort the picture. Why ask for so many items of information, many of which apparently have no relation to the job? J. B. M. Clarke[2] expresses the hope that this disease of the business psychologist, which expresses itself in its crudest form in the application blank, will soon die out. With considerable irritation aroused by the impertinence of some of the inquiries, he protests:

> Why ask for salary in the last positions? Any employment manager knows, or ought to know, the value of a position. What good will such information do? Why ask a person his reason for leaving his last place of work? If he quarreled with his boss or was dissatisfied with the policy of the company or was regarded as a nuisance, do you hope to get the correct answer? And even if you do, what business have you to sit in judgment on your fellowmen because of their unfortunate experiences? Why are you concerned with the lodges or fraternal societies a man belongs to? Those that mean anything to him are likely to detract from his efficiency, and in any case he will likely regard the inquiry as an impertinence, especially if he is a member of some secret societies.

[1] BINGHAM, W. V. D., and M. FREYD, *Procedures in Employment Psychology*, pp. 147–148, McGraw-Hill Book Company, Inc., New York, 1926.

[2] CLARKE, J. B. M., Concerning Application Forms, *Industrial Management*, 71: 25–26; 72: 243–244, 1926.

That Clarke's objections to the increasingly common type of application blank are of some importance few will question. Many of the items asked for on the modern blank are necessary to the personnel department, once an applicant has joined an organization. Many of them are of no value in helping the employment department decide whether or not the applicant is a desirable candidate. The application form should serve as a weeding-out tool, before further inquiry is made regarding the prospect. But why clutter up the filing cabinets of an employment office with numberless complete life histories of applicants, the great majority of which will never be used? During an interview with the employment manager of a large insurance company the information was given, in a quite matter-of-fact manner, that at the time he had 3,400 applications in his files. He hires 100 people annually.

What should be included in an application blank? Clarke says that the only items of importance are the name, address, nationality, mental status, past experience, and health record. Why he thinks nationality so important and how the applicant can give his mental status only Clarke knows. The items that should be included in the application blank are those of differential value for the particular class of job for which the applicant is registering. For some organizations, particularly industrial, one application form may be essential; for others in which there are diverse types of responsible work, for which "outsiders" are hired, the application form should vary with the factors in experience that count for success in the particular types of work. The only way to discover what these factors are is to make a study, in each organization, of those that have made for success in the past. Indications of what factors are important in some types of work are given in the following reports.

1. The *Service Bulletin* of the Bureau of Personnel Research[1] reports a study of 344 salesmen for a firm selling a specialty from house to house. Two factors were predominantly characteristic of their successful men—they were married and aged between thirty-five and forty. No one, of course, accepts the fact that all married men between thirty-five and forty are certain to be successful at that work, or that these are the only items that management should ask for, but they do indicate at least that these two items are important.

2. Kitson made a study[2] of the relation between height, weight, and success among 90 shoe salesmen, and found a correlation of .11 between height and success, and of .05 between weight and success. Obviously, asking applicants for their weight and height was of no value.

[1] *Service Bull.* for June, 1923, Bureau of Personnel Research.

[2] Kitson, H. D., Height and Weight as Factors in Salesmanship, *Jour. Personnel Res.*, 1: 289–294, 1922–1923.

3. The British Industrial Fatigue Research Board[1] studied the relation between age, experience, and success among hand composers in two printing establishments, and found a correlation between age and success of −.47 in one plant and .09 in the other, and between experience and success of −.30 in one and .28 in the other.

However, these studies are concerned with one or two isolated items, and are neither complete enough nor broad enough in the number studied to justify including or excluding the particular items. A more adequate analysis of all the items in the customary form is made in the following studies.

4. Dorothy Goldsmith[2] studied the personal-history records of 502 salesmen of the Guardian Life Insurance Company. From these, 50 whose production and personal-history records were complete were selected and divided into three groups: (*a*) failure, (*b*) borderline and moderately successful, (*c*) successful, the differences being made on the basis of amount of insurance paid for during the first year the men were licensed. The items on which the successful men differed from the unsuccessful were segregated and given a weighted score. All the items were thus given a score range from −2 to +3, the higher score being given to the more important factors. Table 19 gives the weighted values of each of the different items.

TABLE 19.—WEIGHTED VALUES OF ITEMS MAKING FOR SUCCESS

Items							
Age:		Education:		Service:		Experience:	
18–20	−2	8 years	1	Full time	2	Previous life insurance experience	1
21–22	−1	10 years	2	Part time	−2	Confidence:	
23–24	0	12 years	3	Insurance:		To the question: What amount of insurance are you confident of placing each month?	
25–27	1	16 years	2	Some carried	1	Replies	1
28–29	2	Marital status:		None carried	−1	No reply	−1
30–40	3	Married	1	Clubs:			
41–50	1	Single	−1	Belongs to clubs	1		
51–60	0	Occupation:		Does not belong	−1		
Above 60	−1	Social	1				
		Unsocial	−1				

The 502 applicants were then scored and divided into three groups: (*a*) those with a score below 4, (*b*) those scoring 4 to 8, (*c*) those scoring above 8. Each group was divided into three parts: (*a*) those with a

[1] *Report* 16, 1922, British Industrial Fatigue Research Board.

[2] GOLDSMITH, DOROTHY, The Use of the Personal History Blank as a Salesmanship Test, *Jour. Applied Psychol.*, 6: 149–155, 1922.

production record below 50 units, (*b*) those between 51 and 100, (*c*) those above 100. The results from the groupings are given in Table 20.

TABLE 20.—SCORES AND PRODUCTION RECORDS

Production range	Score range			
	Below 4	4 to 8	Above 8	Total
0–49	232	159	42	433
50–99	5	15	8	28
100 and over	6	17	18	41

Thus, if the weighted personal-history form had been used and 4 set as the critical score, 54 per cent of the subsequent failures would have been eliminated, and only 16 per cent of the subsequent successes would have been lost. When the average cost of training life insurance salesmen, $1,000, is multiplied by the number of poor selections, the value of a discriminating application form is evident.

TABLE 21.—RATIO OF SUCCESSES TO FAILURES PER ITEM

Item	Ratio	Item	Ratio
Age:		Marital status:	
23 years and less	49:51	Married	59:41
24–32	58:42	Single	49:51
33–38	64:36	Club memberships:	
39–44	53:47	One or less	43:57
45 and over	50:50	Two	58:42
Selling experience (life insurance):		Three or four	62:38
None	66:31	Five or more	68:32
Less than 3 years	69:31	Schooling:	
3–6 years	86:14	15 years and under	68:32
Over 6 years	90:10	16 years and over	54:46
Offices held:		Out of school:	
Less than 3	59:41	Nine years or less	60:40
3 or more	83:17	Over nine years	73:27
Dependents:		Home conditions:	
None or one	49:51	Rent or board	52:48
Two or more	63:37	Own home	63:37
Number of investments:		Life insurance carried:	
—1	46:54	None	47:53
2	54:46	Some	59:41
3 or more	74:26		

5. A similar study of life insurance salesmen was made among the sales force of the Phoenix Mutual Life Insurance Company by Russell and

Cope.[1] They studied the records of 500 salesmen by selecting each item on the application form, comparing the percentage of successes and failures, and translating each into probable results. The ratios are given in Table 21. For each of the 11 items each applicant was given his chances of success as his score: for example, if he were aged twenty-eight, his score for that item would be 58. The score totals were then compared with the successes and failures. The results are given in Table 22.

TABLE 22.—SCORE DISTRIBUTION

	579–640	641–670	671–732
Number of successes	0	24	76
Number of failures	31	42	27

Had such a scale been used, and the critical score that was later adopted *viz.*, 640, been in use, the expense of training 31 salesmen who were failures would have been avoided. The new method of selecting salesmen was introduced in 1921, and after 3 years a comparison was made between the records of one of the "old" years and one of the "new." The results are given in Table 23.

TABLE 23.—COMPARISON BETWEEN 1912 AND 1923

Items	1912	1923
Number of salesmen	1,700	375
Amount of insurance sold	20,500,000	52,000,000
Ratio of successes	10% of salesmen sold 90 per cent of all insurance sold	30% of sales force unsatisfactory

A reduction of the failures from 90 per cent to 30 per cent seemed to justify the time spent on the research work and to suggest that further research might result in eliminating more of the failures. Accordingly, another study, which was undertaken in 1936 and completed the following year,[2] reports the results from a survey of all the salesmen who were under contract in the regular agencies from 1927 to 1935. Each personal-history item in the application record was studied separately in its relation to success, which was interpreted in terms of (*a*) production, a man's first 12 months' issued business and paid premiums, (*b*) persistency, whether a man remained with the company 1 year, 2 years, or more. Ten of these items were constantly related to success, and among these 10,

[1] RUSSELL, W., and G. V. COPE, A Method of Rating the History and Achievement of Applicants for Positions, *Public Personnel Studies*, 3 (No. 7): 202–219, 1925.

[2] Selecting the Successful Salesman, The Phoenix Mutual Life Insurance Company, Hartford, Conn., 1937, 21 pp.

one—age—entered into every other factor to such an extent that it seemed best to consider age groups as a main control rather than as one of the items of the score. "We found that by separating the cases into age groups the scores on the various items showed a closer relation to production and persistency in the business for the various age groups than when the scores for all ages were considered in one group." An applicant's total score is the sum of his scores on the 10 items, but the score is interpreted differently according to his age; *e.g.*, a score of 49 is a very high score for a man in his twenties, a borderline score for a man in his thirties, and a low score for a man above forty. Critical scores thus vary for each age group. These were divided into three levels, as given in Table 24.

TABLE 24.—VARYING SCORES FOR DIFFERENT AGE GROUPS

Age group	Low	Borderline	High
20–24	0–33	34–39	40 and over
25–29	0–38	39–47	48 and over
30–39	0–45	46–57	58 and over
40–44	0–50	51–62	63 and over
45 and over	0–56	57–65	66 and over

The 10 items that were found to have differential values, together with the range of values given to different phases of these items, are as follows:

a. Marital status and dependents, 2–8.
b. Education, 4–8.
c. Previous income, 0–9.
d. Life insurance owned, 0–9.
e. Previous occupation, 2–9.
f. Selling experience, 3–8.
g. Minimum living expenses, 0–9.
h. Length of residence in the community, 2–6.
i. Present membership in organizations, 0–9.
j. Length of time of negotiations, 5–8.

6. Another study of a different type of worker was made by Viteles[1] in 1926 for the purposes of selecting cab drivers for the Yellow Cab Company of Philadelphia. Selecting 80 drivers whose salaries ranged from the best to the worst, he studied the 25 items in the application form and found only seven that had differential value in estimating a candidate's fitness for the position. These were age, nationality, marital status, number of children, number of dependents, trade followed,

[1] VITELES, MORRIS, *The Science of Work*, pp. 171–195, W. W. Norton & Company, Inc., New York, 1934.

and weight. The possible results of considering only these items were compared with the records of 188 men hired during the first 6 months of 1925. These were divided into three groups—25 per cent each, best and worst, and 50 per cent average. Had the weights given the seven differentials been applied when hiring the men, the results would have been those given in Table 25.

TABLE 25.—ACTUAL AND POSSIBLE CHOICE OF CAB DRIVERS COMPARED

Possible choice	Cab drivers hired and rejected					
	Best		Average		Worst	
	Number	Per cent	Number	Per cent	Number	Per cent
Cab drivers who would have been hired......	37	78	77	82	17	40
Cab drivers who would have been rejected......	10	22	17	18	30	60

Thus the proper weighting of seven differential items in the application would have eliminated 57 of those who had been hired and trained, over one-half of whom later proved to be failures.

7. A much more elaborate study of the important items in an application was made by R. S. Uhrbrock and M. W. Richardson[1] in the interests of selecting supervisors for the Procter and Gamble Company. They made an item analysis of 15 items in the personal-history record, correlating each one with superiors' estimates of supervisors' ability, in order to discover those items that conditioned success. Among the 15 there were four with a constant relation, *viz.:*

a. Amount of schooling. Those beyond 9 years of schooling showed increasing promise, while those below 9 had a correspondingly decreasing chance for success.

b. Ability to read blueprints. This faculty is related to moderate success twice as frequently as it is to failure. In the "high" group, 83 per cent can read blueprints. while in the "low" group, only 37 per cent can.

c. Age. If a candidate is between twenty-five and thirty-nine years, his chances of success are 3 to 1. Seventy-five per cent of the "high" group are in that age range, whereas 49 per cent of the "low" group are above thirty-nine years.

d. Military service and rank attained are favorable to success. Forty-nine per cent of the "high" group, 31 per cent of the "medium," and 19 per cent of the "low" group had had military experience.

The other factors in the application form showed no relation to success. Whether applicants were married or single, owned or rented a home, belonged or did not belong to clubs, were fond of or not inter-

[1] UHRBOCK, R. S., and M. W. RICHARDSON, Item Analysis, the Basis for Constructing a Test for Forecasting Supervisory Ability, *Personnel Jour.*, 12: 141–154, 1933.

ested in sports, had or had not previous supervisory experience, had or had not dependents—all this gathered information had no value in helping management select the successful supervisor.

The value of the weighted application blank as a selection tool has recently received confirmation from two sources: (a) When a committee, appointed by the National Research Council at the request of the Civil Aeronautics Authority to study the tools that may be of value in the selection of pilots, surveyed the field, they agreed that "The use of weighted combinations of biographical items in preliminary interviews or an application blank had established itself strongly enough in industrial practice to warrant a trial in the selection of pilots."[1] (b) During 1940 and the early part of 1941 the Life Insurance Sales Research Bureau made a follow-up study of 1,000 insurance agents who had been hired in 1939 with the aid of an Aptitude Index.[2] The index consists of two parts, personality characteristics and a rating chart that contains 10 items that are given varying values. For example, a weight of 3 is given to each of the following: applicants having no dependents, being unemployed for 3 months, having spent less than 3 months with the present or last employer, and having active membership in no or one organization; a weight of 8 is given to applicants having three or four dependents, having acted in an executive capacity in a retail organization or in a semiexecutive capacity in an office, being unemployed for less than 1 month, having worked for 6 to 8 years with the present or last employer, being connected with three organizations, having a net worth of $10,000 to $15,000, and having conducted negotiations with the company for 2 or more months.

The value of the rating chart as a selection tool is shown by the first-year sales records of selectees. Table 26 gives the percentage ratios, in two age groups, of men who were placed in each of the five groups according to the rating chart.

TABLE 26.—FIRST-YEAR SALES RATIOS OF AGENTS IN TERMS OF THEIR SCORES ON A RATING CHART

Age group	Rank on a rating chart				
	A	B	C	D	E
−25 years	100	73	81	77	61
26 years and over	100	95	66	84	70

[1] JENKINS, JOHN J., Selection and Training of Aircraft Pilots, *Journal of Consulting Psychology*, 5 (No. 5): 233, 1941.

[2] KURTZ, ALBERT K., *How Well Does the Aptitude Index Work?* pp. 74, Life Insurance Sales Research Bureau, Hartford, Conn., 1941.

While these differences are significant, they are not unduly large nor are they consistent; their significance is apparent when one other fact is considered. The same study also showed that those who were rated as A survived the training period in greater numbers than those who were rated lower; the survival rate of the A group was twice as high as that of the D or the E group.

The technique that has been used in these studies is justified in any organization in which there is a fairly large personnel doing one kind of work, especially if there is a long training period and a correspondingly high hiring cost. It is quite true that there are not many positions in industry that justify the time and expense involved in such a study. In offices and sales departments, however, an investigation of this kind should result in a lower labor turnover and a more satisfactory force. For all positions there are desirable factors that the application blank should disclose, factors that job studies reveal and that can be used as a selective tool, thus eliminating many whom tests and interviews later discover to be unpromising. For example, most positions have a favorable age range, a definite type of training as a prerequisite, and are held in a particular organization by a group within a specific educational range. These, and other delimiting factors peculiar to the situation, the application should disclose.

Of course, there is some justification for the lengthy application blank. The floater and the loafer, confronted with formidable four-page folders when they enter employment offices, will reveal their lack of persistence at very little expense to the company; those with shady pasts or with reckless, irresponsible attitudes will tend to avoid organizations that have a reputation for exhaustive study of their applicants; and those who are ambitious and anxious to place everything on the table will tend to seek out the organization that gives consideration to every interest an applicant may have. It is doubtful, however, if these advantages are of sufficient importance to outweigh the unfavorable attitude created in the prospective employee when confronted with a form asking for so much personal history. It is very true that such data are of importance to the personnel manager in his direction of necessary employer-employee relationships. He cannot adequately undertake or sponsor health programs, accident-prevention programs, or mutual-aid systems without knowing considerably more than the application discloses about the employee. The time to gather that information, however, is when the applicant is about to share the services, not before he has undertaken his first job. When he can see a reason for and justification of the type of information sought, the employee rarely hesitates to give needed information.

LETTERS OR RECOMMENDATION

A list of references from nonrelatives who know something of the past life or work history of the applicant is part of the customary procedure of approximately 82 per cent[1] of employment offices now. The references are generally of two kinds: (*a*) those concerned with the work history of the applicant, (*b*) those concerned with the character of the applicant. Quite often the two types of required data are asked for from the same source. They may come to an employment manager in one of three ways:

a. With the applicant, who has solicited a testimonial from his previous employer and takes it with him to his prospective employer. This type of recommendation very rarely gives details or confidences; it usually includes a brief statement that the employee has given satisfactory service and is leaving of his own volition or because of lack of work.

b. From the past employer to the prospective one at the request of the applicant. This may or may not be confidential, is practically certain to be complimentary, and is not in any way related to the type of work the applicant seeks

c. A letter or completed form from a past employer in response to an inquiry from a prospective employer. The value of this type depends upon the specificity of the inquiries, and on the care and honesty with which the replies are made. It can have real value, provided the person who completes the inquiry has kept an account of, or has access to, the behavior and production record of the applicant. This type of recommendation is the only one to which serious consideration should be given.

Before consideration of the form the letter may take, it might be well to point out the weaknesses of the customary recommendations upon which a number of employers depend.

1. Many employment managers face a morning mail studded with inquiries about their past employees. Answering them is part of the "correspondence hour." In the rush of pressing duties, the replies tend to take on a perfunctory character, in which generalities and platitudes take the place of details and specific statements. This is particularly true if the candidate is not well known, and especially if the reply is given without recourse to character and production rating charts.

2. The majority of people writing recommendations seek out the commendable and desirable characteristics of the applicant and give a report of their own estimates of these. Quite often there is an unconscious overstatement of the case, especially if there is undue interest in or attachment to the applicant. Inquiries from 100 salesmen made by a New York sales manager[2] to the questions listed in Table 27 brought forth the percentage of replies given in the "Yes" and "No" columns.

[1] MATHEWSON, S. B., A Survey of Personnel Management in 195 Concerns, *Personnel Jour.*, 10: 225–231, 1931–1932.

[2] To Whom It May Concern, *Sales Management*, 6: 9–11, October, 1923.

Sometimes these highly complimentary recommendations are for the purpose of getting rid of an undesirable employee. As Hollingworth says,[1] "They are sealed with a shrug and opened with a smile." Hepner reports[2] one executive who used them as a means of getting back at a friend who had beaten him in poker.

TABLE 27.—CONTENTS OF RECOMMENDATIONS

Queries	Yes (per cent)	No (per cent)
1. In replying to a letter from a prospective employer regarding the fitness of one of your former employees, do you tell only the good things you can say about the man?	77	23
2. Do you always give the employee the benefit of the doubt?	85	15
3. Do you point out the man's failings as well as his strong points?	39	61

3. Often there is an understatement of the candiate's ability, as a result of one unfortunate experience, one poor impression, one biased report, or some feature about or characteristic of the candidate that serves to remind the reporter of the character and disposition of other workers. An employment manager with a prejudice against red hair, Charlie Chaplin moustaches, bow ties, or any other oddity very easily transfers his attitude to the candidate who happens to possess one of these.

4. An equally important objection arises out of the reporter's unfamiliarity with the social setting or the job demands of the new situation. Unless the requests are specific, he has no guide to help him determine the identity of the elements in the two situations, and can only generalize from the type of experience the old position made possible. These inferences may be reasonably accurate for the type of situation in which the applicant had been placed, but not at all warranted in the new situation.

5. Equally puzzling circumstances are met when the custom is maintained of consulting a large number of references, on the theory that multiplicity assures accuracy. Quite to the contrary, it may produce confusion. An interesting illustration is given by Hepner.[3] A sales manager who did not trust the written recommendation telegraphed to the references given him by the applicant, asking for replies collect.

[1] HOLLINGWORTH, H. L., *Judging Human Character*, D. Appleton-Century Company, Inc., New York, 1922.

[2] HEPNER, H. W., *Psychology in Modern Business*, pp. 222–223, Prentice-Hall, Inc., New York, 1931.

[3] *Ibid.*, pp. 223–224.

Replies from six of his eight wires in the interest of one applicant were these:

Favorable.

a. Can recommend him highly as regards honesty and workmanship. He is 100 per cent. Has worked for me three years.

b. Character and dependability very good. Would recommend.

c. While he was with us he was very satisfactory.

d. I recommend him very highly in every respect.

Unfavorable.

a. He failed to do the work for which he was hired, led an immoral life, owed the company money, borrowed from customers, and was discharged for incompetency.

b. A similar statement telephoned in to avoid putting such statements in writing.

What an employer is to do with such conflicting statements is problematical. The generalizations that are favorable are of much less value than the specific unfavorable items. The net result is that the employer still knows nothing about the work habits, skill, industry, or perseverance of his candidate, all of which could have been given if the proper form of recommendation had been used.

6. When any attempt is made to get character estimates, the common practice of generalizing makes any effort worthless. The inferences are often made on the basis of one specific incident or one habit tendency, without any consideration of the psychological fallacies that are practiced. That habits are specific (*e.g.*, that neatness of dress is no guarantee of neatness of desk) and that one behavioral expression may or may not be symptomatic of an attitude rarely are given consideration by the writers of platitudinous recommendations. Moreover, whenever studies are made of one person's ability to judge another's qualities, not only is there disagreement with others' judgments, but even inconsistency when one person judges the same candidate on two different occasions. J. B. Miner of the Carnegie Institute of Technology had selected subjects rated on a number of traits by people who knew the candidates well, and found the distributions of ratings very little better than chance, varying from 5 per cent in such a trait as energy to 26 per cent in reliability.

With so many obvious weaknesses, there seems to be some justification for the statement made by a New York sales manager,[1] "Frankly, with very few exceptions, letters of recommendations are only good for one thing, and that is to establish the fact that the party in question actually worked for the concern at the time he states. Beyond that they are of little value."

How, then, may recommendations be made more reliable? Their reliability will depend upon the specificity of the desired replies. If a

[1] *Sales Management*, 6: 10, October, 1923.

general recommendation is asked for, generalities are inevitable, and will usually be of very little value. If, on the other hand, the inquirer knows what the job for which the person is applying is going to demand of him, and will make the questions specifically related to job demands, there is no reason why the recommendation may not result in furnishing reliable information about the prospect. The type of inquiry that has produced satisfactory responses is patterned after suggestions given by Burtt[1] and by Bingham and Freyd.[2] A combination and slight modification of their recommendations follows:

DEAR SIR:

(Mr. Henry B. Smith) of (67 Denmark Street, Middletown) is applying to us for a position as (hardware salesman), and refers us to you as a previous employer. Will you kindly answer the questions (on the reverse side of this sheet)? You realize that it will be to (Mr. Smith's) disadvantage to be appointed to this position if he is not fitted to fill it. We shall appreciate prompt and thoughtful attention to the questions, and assure you of cooperation in similar efforts on your part.

Yours very truly,

Please return to:

N.B. Your answer to each question may be indicated by a cross (x) placed in the appropriate brackets.

1. (Mr. Henry B. Smith) states that he was in your employ from (Jan. 10, 1928) to (Mar. 16, 1932), as (machine tender).

Does this correspond with your record? Yes ( ) No ( ).

2. He states that he left because (he was anxious to attend day school and could not do it while in your employ).

Is this an adequate statement? Yes ( ) No ( ).

If not, why did he leave? Discharged? ( ), Poor worker? ( ), Unreliable? ( ), Irresponsible? ( ), No work? ( ).

3. He states that his salary when he left you was ($18.00 per week). Is this correct? Yes ( ) No ( ).

4. Was he always honest in financial dealings? Yes ( ) No ( ).

5. Would you be willing to re-employ him? Yes ( ) No ( ).

6. Did he have any habits to which you objected? Yes ( ) No ( ).

If so, please state them.

7. Will you rate him on each of the following seven qualities:

a. Powers of application. Exceptionally industrious ( ), Industrious ( ), Performs work assigned ( ), Shiftless ( ), Lazy ( ).

b. Work habits. Very persistent ( ), Determined ( ), Ordinary ( ), Easily discouraged ( ), A quitter ( ).

c. Eagerness to advance. Keenly ambitious ( ), Moderately ambitious ( ), Easily satisfied ( ), Indifferent ( ), No ambition ( ).

d. Popularity. Very popular ( ), Good mixer ( ), Average ( ), Exclusive ( ), Unpopular ( ).

[1] BURTT, H. E., *Employment Psychology*, pp. 409–441, Houghton Mifflin Company, Boston, 1926.

[2] BINGHAM, W. V. D., and M. FREYD, *Procedures in Employment Psychology*, pp. 150–151, McGraw-Hill Book Company, Inc., New York, 1926.

e. Physical appearance. Commanding ( ), Pleasing ( ), Average ( ), Attractive ( ), Insignificant ( ).
f. Manners. Obtrusive ( ), Friendly ( ), Well-mannered ( ), Retiring ( ), Bashful ( ).
g. Clothes. Stylish ( ), Well-dressed ( ), Ordinary ( ), Untidy ( ), Shabby ( ).

Signed__________________________

These suggested questions have some relation to the particular job for which the applicant is being considered, and should, of course, vary with the general nature of the work. They should call for statements, as far as possible, rather than for opinions. They should ask for specific factors rather than for general statements, and they should be addressed to employment managers who have ready access to employees' rating cards and production records. Unless recommendation requests are thus limited and made specific, the information gathered from them may be detrimental to the best interests of the applicant and expensive to the organization. The difficulty with the use of such a questionnaire lies in the fact that some companies have adopted the policy of never committing themselves, except at government request, regarding any previous employee.

THE PHOTOGRAPH

Since Hollingworth published his book, *Judging Human Character* (1923), and summarized the isolated experiments showing the futility of character judgments from photographs, there have been repeated confirmations of his conclusions; yet, in spite of these, the photograph is a common part of employment procedure in many offices today. Justification for its use for some types of position is readily found. Positions that are of a social nature and that demand frequent contacts with people, in or out of the organization, make it necessary for the employer to seek to fill them with persons who have no facial defects. Positions in which it is desirable that the occupants should show moderate attractiveness, grace, and poise are increasing in number. The full-face photograph serves the purpose of limiting the candidates who will go through the next step, be it interviewing or testing, in the employment procedure. In addition to that, the photograph serves the same purpose as the fingerprint—it identifies the owner—and saves the employment manager, who may have a poor memory for names and faces, from an occasional embarrassing situation. Whether it can be used for other purposes or not is doubtful.

Experimental data show, quite conclusively, that there is neither consistency of judgment nor high correlation with any other criterion when the photograph is used as a basis for estimating mental ability.

A physically attractive, well-developed person is commonly given a higher estimate than his mental tests or academic record warrants; and a person with a minor physical, especially facial, defect is commonly rated lower than the records indicate that he should be. Laird and Remners[1] compared the ability of several hundred people to estimate from photographs the mental level of a number of subjects whose score on one standardized test was known. From the results, they concluded

a. That judgments would have been just as accurate if made with closed eyes.

b. That women are no better than men, the old no better than the young, and the intelligent no better than the stupid.

c. That two or three judges working together are no more accurate than a single judge.

d. That professional character analysts and vocational counselors are no better than the average of 376 other judges who estimated the relative mental level of the subjects.

On the other hand, there are occasional instances in which individual judgments agree with objective criteria quite markedly. Hollingworth reports one judge whose estimate of the intelligence of 20 people correlated .51 with the results from an intelligence test,[2] and in another study in which he asked 25 men and 25 women to arrange 25 photographs in rank order for three different qualities, and correlated these results with the average estimates of 25 acquaintances, he found a correlation of .61 for vulgarity, .58 for snobbishness, and .60 for beauty for the men judges, and corresponding correlations of .69, .53, and .49 for the women judges.

The rank-order method of evaluation, however, on the part of either judges or acquaintances, is a tool in which little confidence can be placed. It is a rare acquaintance who can retain the names and degrees of snobbishness or vulgarity of 25 of his associates and arrange them in any kind of acceptable order of merit. Moreover, his judgment is nearly certain to differ from that of any other acquaintance of the same 25 people. Proof of this inability to rank people on any trait is given in a study made by J. B. Probst[3] on a comparison between the relative positions of the 10 best-known actors and the 10 best-known actresses. The judges, 10 men and 10 women, were simply asked to rank the actors in one group from best to worst and the actresses in another, in the same manner. The results (of actors from the 10 men judges and of the same 10 actors from the 10 women judges) are given in Table 28.

[1] LAIRD, D. A., *Psychology in Selecting Men*, pp. 112–113, McGraw-Hill Book Company, Inc., New York, 1927.

[2] HOLLINGWORTH, *op. cit.*, p. 38.

[3] PROBST, J. B., How Reliable Is Your Judgment? *Pub. Personnel Studies*, 8 (No. 8): 114–115, 1930.

The disparity in positions is evident if one looks at the judgments on any one actor: for example, A is ranked in all positions between 1 and 8; B in all between 4 and 10; C between 1 and 10; D between 2 and 10; E between 1 and 10; F between 1 and 9; G between 1 and 10; H between 1 and 10; I between 3 and 10; and J between 2 and 10. Quite often the best actor or actress in the group for one judge is the worst for another; yet, despite these differences, the average of the women's judgments gives the first and last three places to the same actors as the average of the men's judgments. The inference is, as with average agreement in the judgment of intelligence, tact, neatness, or any other trait, that one element, probably popularity or rate of pay in the case of the actors, is used as the basis of judgment by the majority of judges.

TABLE 28.—RANKING OF 10 ACTORS BY 10 MEN AND 10 WOMEN JUDGES

Judges		Actors																			
		A		B		C		D		E		F		G		H		I		J	
M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W
A	*A*	8	4	9	10	2	7	5	5	1	2	4	1	10	9	3	3	7	8	6	6
B	*B*	5	2	10	8	9	5	3	9	7	1	2	3	4	4	1	7	8	10	6	6
C	*C*	4	1	10	8	3	9	5	7	2	2	8	5	9	6	1	3	7	10	6	4
D	*D*	2	5	6	10	1	9	5	7	3	4	8	1	9	8	7	6	10	3	4	2
E	*E*	6	8	7	4	10	5	5	3	2	2	1	9	9	10	3	1	4	7	8	6
F	*F*	2	3	4	8	8	6	5	7	1	4	3	1	7	9	10	2	6	10	9	5
G	*G*	3	2	6	9	1	8	8	7	5	1	7	6	9	10	2	4	10	5	4	3
H	*H*	4	2	5	7	6	9	7	10	1	4	3	6	10	1	8	5	9	8	2	6
I	*I*	4	3	6	6	9	5	7	2	10	1	2	7	5	10	1	4	8	9	3	8
J	*J*	8	8	10	9	6	4	2	5	5	1	1	2	9	7	4	3	3	6	7	10

A more exhaustive and statistically evaluated study of the value of photographs was made by Viteles and Smith.[1] Twenty-four members of a personnel association, the majority of whom were employment managers or interviewers in large industrial plants, were shown, by the projection of one at a time on a screen, 80 photographs of which 40 were of successful and 40 were of unsuccessful men; half of the photographs were those of seniors in college, and the other half those of the same men 25 years later. The judges were not advised of the identity, but were asked, as each photograph appeared, to record

a. Whether the man was (in the case of the older group) or would be (in the case of the younger group) successful.

b. The per cent certainty of his judgment.

[1] Quoted by MORRIS VITELES in *Industrial Psychology*, pp. 186–190, W. W. Norton & Company, Inc., New York, 1932.

c. The occupation in which the man was employed (older), or into which he should go (younger).

d. The basis of the judgment, *e.g.*, shape of face, height of forehead, etc.

The results were compared with the actual results from average annual salaries over a period of years. All the men were in the fields of law, medicine, engineering, or education. The judgments of the personnel men were compared with those of college students on the same group. In response to question *a* there were only two choices—whether or not the person was a success; the judges had a fifty-fifty chance of being correct. The results from query *a* are given in Table 29.

TABLE 29.—PER CENT OF JUDGMENTS OF SUCCESS AND FAILURE

Judges and criterion	Photographs			
	Younger men		Older men	
	To succeed	To fail	Successful	Failures
Personnel men	52.2	47.8	52.8	47.2
College students	47.3	52.7	51.3	48.7
Actual results			50 0	50.0

In neither case, whether in the judging of the old or the young, whether the judgment is by the undergraduates or by experienced personnel workers, are the results better than chance.

On query *b* the results showed that the older a person is the more certain he is of the correctness of his judgment, be it right or wrong. The personnel workers were certain in 53.7 per cent of their judgments, whereas the college students were certain in only 32.6 per cent of theirs, despite the fact that in both cases approximately 50 per cent of their judgments were wrong.

There was not even an approximation to accuracy in the selection of careers. The common occupations open to college graduates were given to the judges and arranged in seven groups. The occupations selected ranged all over the seven groups, and included many occupations to which no member belonged. The basis for their judgments was reported by the personnel men to be "general impression" and "facial expression" in over 50 per cent of the cases.

The only conclusions that can be drawn from these studies are that anyone's ability to judge another person's qualities from a photograph is as accurate as if he tossed a coin for the decision and that the only possible value a photograph can have is for identification purposes and for impressions of appearance, when the position at stake demands that the latter be given consideration.

THE INTERVIEW

The interview is the tool most widely used in employment offices today, and often the only one. Because of the extensive use of it and the important part it plays in the mind of the worker and in the expense account of the firm, this practice deserves serious consideration. Mathewson[1] reports that 93 per cent of the 195 personnel departments that he surveyed regarded the interview as the most important part of their employment procedure. Viteles[2] says there are few instances in which a man is hired without a personal conference, even when other procedures are employed. Quite often, after a very short or a more extended interview, applicants are accepted on the basis of its disclosures. The personalities involved, the procedure followed, and the information gathered are the factors that determine the result. The importance of each is obvious.

The Interviewer.—The one who conducts the interview is the most important entity in the entire situation to the applicant, and often to himself. His fund of knowledge, his prejudices, and his attitudes will project themselves into every conference he has and will be as determinative of the final outcome as are the qualifications of the interviewee. What kind of person should he be? Frequently, he is one of the oldest employees in the firm, one who has outlived his capacity for normal production, who is supposedly familiar with the different requirements of all the jobs, and who, on the basis of that knowledge, is thought to be adequately fitted for deciding whether or not others should do the type of work he once did. Hackett says,[3] "Interviewing is one of the arts where mediocrity can flourish indefinitely with little chance of discovery." In increasing numbers today, however, a new type of interviewer is taking over the job—one who has been trained for it and has the personality qualifications that enable him to do justice to the organization and at the same time send every applicant from his office with a much better understanding of himself than before and with a favorable attitude toward the firm. To perform this function he must be equal to the demands of the situation from two standpoints:

a. Possession of the proper personality traits. The most important of these are
1. A real interest in, understanding of, and fondness for, people.
2. A capacity for radiating the impression of sincerity and genuine interest in others, together with behavioral patterns in speech and action that inspire confidence.

[1] Mathewson, *op. cit.*

[2] Viteles, *op. cit.*, pp. 169–170.

[3] Hackett, J. D., The Art of Interviewing Workers, *Industrial Management*, 60: 338–340, 1920.

3. A reasonably good memory, not only for names and faces, but also for the details of a disjointed story, the power of staying with these details until they are thoroughly mastered, and a capacity for speedy evaluation of the significant parts.
4. Interpretative capacity, so that he can understand the implications of casual remarks and incomplete or inadequate descriptions of experiences.
5. Ability to hit quickly on common ground between himself and applicants with varied types of experiences.

b. *Possession of a sufficient trade knowledge.* For whatever organization he hires employees the interviewer must know the job demands of each position. This knowledge may be gained through apprenticeship work in job analysis and in drawing up job specifications for the more common types of work, before he takes on the responsibility of hiring others; and for the less frequently changing jobs, he may gain the same experience during the spare moments when the employment office is not open to applicants. Or he may gain his knowledge through experiences in representative types of work in the organization.

R. J. Waldo, who has had considerable office experience in the Studebaker Corporation, says:[1]

I would never part with the vast fund of information I have gained from the ranks, in the shops, and by mingling with the men. I have learned better and far more accurately the things an interviewer must know to make him efficient in the selection of men when with the men themselves than I could ever have learned in any school.

Whether the interviewer gets his information through job analysis or through experience, a thorough familiarity with the job demands in their social and physical setting he must have. In addition, he should be able to talk the language of the majority of his applicants. If in one division or department the majority of the workers are French or Polish, conversation in the native tongue will break down barriers that broken English is bound to erect. To do his task properly, the man who interviews workers should know the promotional possibilities of every job, the wages paid for similar jobs in local industries, and the technical changes that innovations impose on the job. He should be a constant student, not only of local labor conditions, but of labor policies, legislations, and disputes, and should have first-hand information of developments in his own industry. Every technical and trade publication dealing with positions for which applicants are interviewed should be at his disposal, and working techniques adopted by competing and even dissimilar organizations, he should know.

The Preliminary Interview.—In most of the larger organizations today the main interview is preceded by a preliminary interview con-

[1] WALDO, R. J., The Art of Interviewing Applicants, *Industrial Management*, 60: 273–277, 1920.

ducted by an assistant or a reception clerk in the waiting room. Many applicants will not get beyond this first stage. Equipped with information about the key points and demands of available jobs, the assistant greets each candidate with a very few important questions, lasting from 1 to 2 minutes, on the basis of which he decides the applicant's likely candidacy for the available positions. Because this may be the only acquaintance that 60 per cent of the applicants have with the organization, attempts should be made to create in them a favorable attitude toward the firm and to show the reasonableness of their not wasting their time.

The waiting room should be located on the ground floor so as to minimize traffic of applicants over company property; it should be well lighted and ventilated, sufficiently large to accommodate the number of applicants admitted, furnished in a reasonably comfortable fashion, and provided with literature, particularly about the company's hiring policy and employment record. The assistant should know what jobs are available, should be able to give information on the likely turnover possibilities in different types of work, and should be familiar with the experience and educational requirements of each job to be filled. There should be assistance for those who seek it when filling in the application blank; special attention to those who, for some satisfactory reason, ask to have immediate consideration; and information—to the extent that the company permits—for those who seek it. Every effort should be made to create in the applicant a favorable impression, and to give each one the type of consideration that the time limits permit. Candidates who are eligible for the next step in the hiring process should be given replies to reasonable inquiries, and those rejected should be advised if and when other possibilities in the firm are likely to occur. The interviewer should be businesslike in his or her approach, be governed by time limits for each interview, *e.g.*, 2 minutes for each promising candidate and 1 minute for each obviously undesirable one, and should maintain the dignity and courtesy for which the executives of the organization stand.

The Main Interview.—The type of interview conducted by the chief interviewer will naturally be in keeping with his temperament. If his hobby is statistics, he will seek for such data as will lend themselves to statistical evaluation; if he has psychoanalytical inclinations, and is constantly on the hunt for underlying causes and hidden motives, his interview will be directed to "reading between the lines"; if he is a slave to system, he will methodically acquire the information that the job demands; if he is inclined to be hard-boiled and believes that making a job difficult is the best way to discourage the slacker, his tactics will conform to his convictions. The method adopted is determined by the personality of the interviewer, and will vary according to the varying

expressions of whatever convictions, beliefs, and emotional attitudes determine the pattern of his thinking.

There are today two commonly used forms of interview.

1. One is a standardized form with a predetermined list of questions to be asked, the answers to which are recorded during or shortly after the interview. Wonderlic[1] suggests that the following questions are sufficient when people are being hired for contact positions.

a. Give the names of your past employers, and tell how you got each job, what you did, and why you left.

b. How did your previous employer treat you?

c. What experience of value did you get from each job?

d. Did you do work of such quality that your employer would be glad to recommend you?

e. Were you ever criticized for the kind of work you did? Give some examples of mistakes and failures.

f. Can you give me any example of success in your experience, particularly in handling people?

g. What kind of work did you enjoy the most and seem to make the most progress in—mechanical, problem solving, detail, contact, or don't you know?

From this cross-examination Wonderlic thinks the interviewer ought to be able to satisfy himself on what kind of work history the applicant has, whether or not he can work consistently, if his work has been of such a type as to develop habits of persistence and aggressiveness, whether or not his work history reveals habits or attitudes that would make it easy for him to adjust himself to the policies and procedures of the company, and whether or not the candidate is a good soldier, as evidenced by good teamwork.

The advantage of such a standardized interview is that the desired information is usually gathered, and the interview can be conducted by anyone who is capable of getting the cooperation of others. The disadvantages are many. Any rigid procedure is detrimental to the establishment of cordial relations; it easily assumes the artificiality that the printed questionnaire has, and is subject to the same kinds of errors of commission. As Morgan says,[2] "Any attempt to formulate a standard practice is practically useless. There is no such thing as a right method of interviewing. The method of procedure depends upon conditions. No mechanically devised system will ever be formulated to meet the problem."

2. A much more common form of interview is of the conversational type. In this the method of approach is determined by the data that the application form discloses, and it varies from applicant to applicant,

[1] WONDERLIC, E. F., Personnel as a Control Function, *Personnel*, 14 (No. 1): 31–40, 1937.

[2] MORGAN, E. B., Interviewing for Selection, *Industrial Management*, 61: 159, 1921.

depending on the preliminary information that preparation for the interview has made possible. The desired information, which is gained indirectly, casually, and incidentally, is recorded either unostentatiously during the interview or after the applicant has departed. Sometimes the complete interview is recorded on a concealed dictaphone, and the significant remarks are selected from the record. To conduct an interview of this kind is much more difficult than it is to solicit answers for prepared questions; but this procedure can be much more effective in gaining the applicant's cooperation and in eliciting reliable information than is possible with the stereotyped form of questionnaire. To conduct such an interview properly the interviewer must have privacy and comfort, must know specifically the information that each interview should disclose, and must be capable of getting that information in a matter-of-fact manner, instead of in the form of a cross-examination that has all the earmarks of the third degree. Preparation on his part for each interview is essential. The application form should disclose sufficient details to offer him a point of departure; the recommendations should remind him of the candidate's probable weaknesses; and the gaps in the work and personal history of his prospective visitor should be known before he attempts to complete the picture of what a likely coworker may have to offer him.

The Functions of the Interview.—The facts to be gathered during the interview will vary from candidate to candidate for the same position. The essential task is the completion of an incomplete picture of an individual, the corroboration or refutation of his own and others' reports of his past behavior and attitude, and the eliciting of such items from his experience as will not be likely to appear in written form. Bingham[1] says that every interview has three functions: motivating, instructing, and securing information from applicants. Its primary, and often its only, service lies in eliciting information from the applicant concerning his history, habits, and abilities.

The amount of such information that one should attempt to gather depends upon the presence and completeness or the entire absence of the application form. If no application blank is used, the interview may be an exhaustive inquiry into work and personal history, or it may be limited to significant questions. Frank W. Lovejoy, formerly employment manager of the Socony Vacuum Oil Company, thinks[2] that in hiring salesmen he needs to ask only five questions in order to determine the qualifications of the man: How's his health? Is he interested in people?

[1] BINGHAM, W. V. D. and B. V. MOORE, *How to Interview*, 3d rev. ed., pp. 159–164, Harper & Brothers, New York, 1931.

[2] LOVEJOY, FRANK W., In Hiring a Salesman, *Printers' Ink*, June 10, 1937, pp. 37–42.

Can he use his brains and tell why he does some of the things he does? Can he sell himself? Does he more frequently smile than frown? On the other hand, many interviewers use the time to gather important reactions that cannot be secured through any other avenue. The reactions may have some relation to issues that have a definite bearing on the job, or they may be concerned with attitudes, preferences, opinions, habits, and urges. J. Mills, who was employment manager for the Bell Telephone Company for many years, says[1] that his primary concern in selecting engineering graduates is indicated in the following questions:

a. Along what lines of endeavor do their fundamental interests and urges lie? (To assist the applicant's replies, Mills gives him descriptions and illustrations of the four common tools men use in the nonartistic professions—ideas, men, things, and symbols—and asks each candidate to arrange them in order of decreasing interest to himself.)

b. What type of course fascinated him most during his college career? (Suggesting that his courses may be arranged in seven groups—theory, manipulation, design, methods of operation by human beings, methods of operation by physical equipment, engineering costs and economics, and artistic, literary, and nonprofessional interests—Mills asks each applicant to select the three groups that had for him the greatest appeal.)

c. What distinct personality characteristics and physical qualities will determine his decisions? (To get the applicant's reaction, Mills describes two positions with equal salary returns but with different responsibilities, and asks for his preference.)

Justification for some such techniques as those adopted by Mills is determined by the type of position that the applicant is likely to fill If he is a candidate for a supervisory or a minor executive position, the time spent in eliciting facts and judgments that will indicate attitudes is justifiable; if, on the other hand, the position is a minor one, it is a rare employment manager who has time or ingenuity for devising varied types of situation that will sound out attitudes and motivating forces. The facts more frequently sought are those of a type not adequately covered in the application blank. A few cautions are necessary for the eliciting of these facts:

a. Questions already answered in the application blank should not be repeated unless the applicant is told why his answer is inadequate.

b. No direct question should be used until rapport is established and the interviewee is ready to give the desired information accurately.

c. Questions related to one phase of the applicant's life and interests should be arranged in succession, and given in a simple, straightforward manner, without any attempt at shrewdness, cleverness, or trickery.

d. The interviewer should avoid the attitude of the authoritative, impertinent cross-examiner, who always puts the applicant on the defensive and prevents any natural expression of hopes or interests.

A function of the interview equal in importance with that of eliciting information is the giving of information. The position for which the

[1] MILLS, J., Engineering Aptitudes, *Jour. Personnel Res.*, 3: 197–207, 1924–1925.

candidate is applying is known but vaguely to him; at the most he knows only the technical requirements of the job. He knows nothing of the conditions under which he may work, the kind of associates he may work with or for, the promotional possibilities of the job, and the exactions which incidentals of the job may impose on him. That information the interviewer ought to give. Naturally he does not waste time in giving it to every applicant. In the cases of many, the first few minutes will disclose sufficient facts to indicate their undesirability. Macy's reports for 1930 showed that 35,037 candidates were interviewed to make 11,380 selections. Obviously, the 20-odd thousand who were rejected did not need to be told the setting of positions they never would fill.

In case, however, the candidate shows no undesirable traits and is by training fitted for the job, a fairly thorough description of it in its environmental setting should be given. To present that adequately the interviewer must have accurate information, not only concerning the specifications and the man requirements of the job, but regarding its limitations, disadvantages, and contacts. J. T. Crawford says,[1] "An interviewer can no more select a uniformly high quality of applicant without specifications and tests than a mechanic can produce a high quality of work without blueprints and measuring devices."

Written detailed specifications for each job, and standard tests, should be set up, applied, and revised toward perfection as weak points and inconsistencies come to light through the follow-up of applications that have been accepted.

The third function that Bingham gives the interview—motivating the applicant—applies equally well to the accepted and the rejected candidate. The accepted candidate should be informed of the hours of work, the necessary qualifications for the job, the rate and method of compensation, the standard production demands, the normal length of time taken by novices to reach that standard, the rewards for exceeding the standard, and the penalties for failing to reach it in normal time. If any incentive system is used, he should be advised of its method of operation and be given some indication of the accomplishments of fellow workers who carry on the same type of operation he is about to learn. If the candidate is rejected, the interviewer should at least offer some constructive suggestions. Primarily, every interviewer is and should be a vocational counselor. When he rejects applicants he should convince each one of the soundness of his judgment, point out the applicant's assets, and possibly suggest avenues where they may be used or training centers in which they may be developed. Satisfactory dismissal of a rejected candidate is as important a part of the interviewer's

[1] CRAWFORD, J. T., The Art of Interviewing, *Industrial Management*, 61: 314–315, 1921.

task as is the selection of a desirable one. The grounds for refusal will be determined, if the interviewer is objective in his decision, by two factors:

a. The inferior or superior qualities of the applicant. He may be physically, socially, or mentally unequal to the task, or he may have such superior qualities that he would quickly outgrow and become dissatisfied with the position.

b. The company's policies may prevent the hiring of an otherwise desirable candidate.

Applicants of some undesirable nationality for some particular piece of work or those coming from a center where there has been considerable labor trouble or from a firm with a reputation for hiring inferior types of workers are representative of those on the taboo list in some plants. An interesting illustration of this is given by Bingham[1] in a study made of the ratio of successes and failures among 248 women of different nationalities employed at machine-tending jobs. Table 30 gives the results of his survey. One outcome of this survey is that the firm has since been cautious about placing any American or British girl on that particular type of work.

TABLE 30.—PER CENT OF SUCCESSFUL WORKERS IN DIFFERENT RACIAL GROUPS

Racial groups	Number employed	Per cent successful
Austrian, German, and Scandinavian	22	63
Czechoslovak and Polish	136	50
Italian	14	43
English, Scotch, and Irish	19	26
American	31	19
Scattering	26	33
Total and average	248	43

An illustration of what five employment managers and 20 observers regarded as the best of seven interviews in which the managers took part is shown in the following verbatim report. R. S. Uhrbrock had seven interviewers—four experienced personnel men and three department heads—confer with a number of seniors at the University of Cincinnati.[2] Each interview lasted 12 minutes and was reported as conducted. The number of words used in the different interviews ranged from 596 to 1,248, the applicant's share ranging from 26.68 to 52.81 per cent. In the interview commonly agreed to be best the applicant used 651 words and took 52.16 per cent of the total conversation.

[1] BINGHAM, W. V. D., *Personnel Research Federation Studies*, No. 9, 1926.

[2] UHRBROCK, R. S., Analysis of Employment Interviews, *Personnel Jour.*, 12: 99–101, 1933.

INTERVIEWER: What class are you in?

APPLICANT: I graduate this June. I finished at the end of April, but will not graduate until June.

I.: You are applying for a position at ______ as a student manager. I presume you are fairly well interested?

A.: I'd like a job like that very much. I'd like to work for ______.

I.: What is your working experience?

A.: I have worked after school hours since I was a boy. My first job was as a grocery boy. Mostly concerned with work in a packing house. Mostly along mechanical lines and along the processing departments, though I have worked in four different departments. I have been employed by ______ and Company and since I came to Cincinnati I have co-oped with the ______ Company, which is purely a pork house, but I have had experience with feed products at ______ & Company. While at ______ I started as a helper in the warehouse department, and gradually I took over plant engineering. When there would be little work for men in that line, I got Mr. ______ to let me work in the processing department. I got through the killing and cutting and smoking and curing departments. I am thoroughly familiar with meats. I won't say I have had so much experience with the staple articles, but I believe with the background and training in food products I have had, I would be able to pick up that a little faster than one who did not have that training.

I.: Would you be interested in store work or in the meat line? Your experience has been in the packing house.

A.: I prefer packing houses. I like that sort of work. I'd be willing to take a position in your organization if it led to a more responsible work than as a grocery manager. I think it has just so happened that my training has been in the packing houses. Because of my training with ______ & Company, that has been the co-op job I was placed in when I first came to the University. Then the depression came on and I made the best of it. I tried to learn all I could in that particular line. I really can't say I would want to follow that kind of work to the exclusion of anything else.

I.: Do you think that ______ offers you enough opportunity for advancement?

A.: I have made a few inquiries. The company is much larger than the company now employing me. I would naturally assume that the opportunities were that much greater.

I.: Are you willing to go through a rather long period of training at a low salary?

A.: I'd be willing to do that if, of course, I could live on the salary paid. I have now spent about five years at the university and if I had to discard all that and start another training course ______.

I.: I mean training that would pertain directly to the grocery business. You would be well qualified to manage a store. That training would last three or four months before you would be capable of taking over a store.

A.: That would appeal to me. As far as three or four years are concerned ______.

I.: It is not easy work. To begin with the store work is hard. There are long hours connected with it. Ten hours every day and thirteen or fourteen on Saturdays. There is often overtime, and in this work you get any number of hard jobs. You may be washing windows or sweeping floors or scrubbing counters, cleaning the rear room or the basement, or unloading trucks. Some of the sacks and loads are heavy, weighing over 150 pounds. I wonder if you would stick it out.

A.: You are familiar with the operations around a packing house. For six weeks I worked on the killing floor. I started driving hogs and from there went to the sticking pen, which is probably the dirtiest job there is, and I handled the products from the inedible parts.

I.: Anyone that went through that will be qualified to stick out the grocery business.

A.: As far as hours are concerned, I worked, as I said, as a boy, in the grocery store. I went to work at 6 o'clock.

I.: There is opportunity with our company. We do promote from the ranks. We get all our supervisors and superintendents from the grocery store managers. Such promotion would not come overnight or in a year or so. You may have to work as a student manager for several months, and as manager of a store for several years. We are laying a foundation during the depression and we are looking for college graduates, men with educational background on whom we can build, more so than in the past. In the past our store managers were selected by supervisors and there was no real selection made. If there was a need for a man, the first man they met on the street would get the job. Now we do try to get more capable men. As far as the salary is concerned, we start the men out at $20 a week and that lasts through the training period. At the end of two weeks we have a good checkup on the man and we determine at that time whether you are going to remain in the grocery business and be satisfied with it. If you are dissatisfied, you lay your cards on the table and tell us whether you want to continue. If we are not satisfied with your work, we lay our cards on the table and ask for your resignation. After you complete your training work and are qualified to manage a store, we select our managers from 50 students. We endeavor to place the men in neighborhoods suitable for them. I would not want to place you in the west end of Cincinnati. I would want to place you in a better neighborhood. You would not want to work in that section where there are so many Negroes. Their dollars are as good as anyone else's, but there are certain men for certain neighborhoods. After you finish the training and are promoted to a business manager, your salary would average $35 to $38. Would you be satisfied to continue with that for at least three years?

A.: Yes I think so because, well, I don't know how to express it, but I'm looking for a job with the ______ ______ and ______ Company and the opportunities for advancement are there in an organization of that size and I'd be willing to take a chance on being advanced out of the $35 a week job as I developed in the organization.

I.: We require a physical examination.

A.: My health has always been very good.

I.: What courses have you taken?

A.: Mechanical engineering courses. I took mechanical engineering because I thought I did not know exactly the line of work I would be thrown in and that is probably as general a course as you can take in this school. You get some business and some chemistry, electricity and mechanics. I'd be glad to send you a complete outline of all the experience I have had during my co-operative work and previous to that.

I.: I would be interested in getting that and also be interested in having you examined by our company physician. Drop in again.

It will be noted that during the interview the applicant's interest in the particular type of work and satisfaction with the prospects the job offered were elicited, together with some proof of the satisfactoriness of his experience and training for the promotional possibilities the job would offer, before any information was given to him about the policy of the company or its method of selection or promotion.

The Pitfalls of the Interview.—The value of the information gathered in the interview and of the judgments formed from that depend primarily upon the interviewer—the rapport he succeeds in establishing, the confidence he inspires, and the results he hopes to get. If he thinks that in a 10-minute interview he can size up the personality of his candidate and read his character and future from a few physiognomical signs or mannerisms, he is doomed to disappointment. The dangers to which the interviewer often succumbs are

1. Making a job too attractive by overplaying the desirable features and leading his applicants to mountain tops and promised lands, so that only later they discover how politics, seniority rights, and competition seem to make the realization of their hopes an impossibility before old age is at hand.

2. Being so familiar with, and having repeated so often, the job specifications and demands that he drops into careless habits in his description of the job. He forgets the human tendency of assuming that what we repeat often everyone knows. On the other hand, if his knowledge of the different jobs is not accurate enough, he may lend himself to the possibility of being put through an educational process by an experienced worker. He may be equally at fault in accepting facts about a job, supposedly secured accurately, but actually based upon the casual observations of one person.

3. Being a victim to an uncritical adoption of common errors in estimating people, particularly being partial to people who remind him of intimate acquaintances or good coworkers; attributing definite qualities to a person because of a favorable general impression; being governed by such stereotyped forms of thinking as ascribe particular characteristics to definite classes or occupations; and associating certain casts of countenance with particular qualities.

No good interviewer accepts the belief that a bulldog jaw suggests tenacity, that fine lines about the eyes suggest a happy disposition, or that being a victim of dyspepsia is a guarantee of melancholia. "There are no fixed anatomical characteristics of the head or face by which character or personality traits may be estimated with any degree of accuracy."[1]

4. Assuming that his judgment is correct without having sufficient corroboration. It may be true that some selected and well-trained interviewers are more often right than wrong in their estimates of candidates' fitness for a position. Some studies corroborate their belief; *e.g.*, Clark[2] found a correlation of from .61 to .73 between interviewers'

[1] CLEETON, G. W., Validity of Character Judgments Based on External Criteria, *Jour. Applied Psychol.*, 8: 215–231, 1924.

[2] CLARK, E. L., Value of Student Interviews, *Jour Personnel Res.*, 5: 204–207, 1926.

estimates of students' ability to study and their actual grades; and Laird reports one study made by W. D. Scott[1] in which the rank positions assigned to 12 salesmen by one of the superintendents who interviewed them before they were hired correlated .87 with their production records one year after their training was completed. On the other hand, the majority of follow-up studies show a lack of agreement among interviewers when different men interview the same applicant, and a low correlation between forecast and production rank. Scott reports a correlation of only .06 between judgments of one of the superintendents and the production records of 12 salesmen in the study reported by Laird. In another study,[2] in which he had six sales managers interview 36 applicants and arrange them in rank order, there was unanimity for only eight of the applicants with respect to which half of the group they should be put in. Table 31 gives an illustration of the disagreements in the judgments. In it the rank positions to which each of the six managers assigned the first 16 of the 36 salesmen are given.

TABLE 31.—RANK POSITIONS GIVEN TO SIXTEEN SALESMEN CANDIDATES BY SIX MANAGERS

Applicants	Sales managers					
	A	B	C	D	E	F
I	5	11	2	1.5	3	2
II	8.5	11	13	3	7.5	5.5
III	6.5	18.5	25	21	15	22
IV	2	2	1	1.5	1	5.5
V	15	3	4	28	3	14.5
VI	1	11	5	9	15	3
VII	17 5	18.5	19	12	23	26
VIII	14	18.5	27	16	15	23
IX	28	11	22	11	3	9
X	18	11	16	18	15	10.5
XI	12	30	22	35	30	14.5
XII	3	23	12	5	15	19
XIII	4	11	6	24	23	18
XIV	31	5	8	4	7.5	2.5
XV	6 5	1	7	7	7.5	7
XVI	28	30	3	29	23	8

It will be noticed that there was fairly close agreement on only two of the candidates, IV and XV, whereas some of the others were given any

[1] LAIRD, *op. cit.*, pp. 101–115.

[2] SCOTT, W. D., *Advertising and Selling*, October, 1915, pp. 5–6, 94–96. Similar studies are reported by HOLLINGWORTH, *op. cit.*, pp. 61–67; VITELES, *op. cit.*, pp. 173–177; and LAIRD, *op. cit.*, pp. 102–104.

position in the entire range. V ranged from 3 to 28; VIII from 6 to 27; XII from 3 to 23; and XIV from 5 to 31. It must be remembered that these judges were all experienced employment managers, and yet there was very little agreement between any two of them. It is obvious that the average interviewer who is certain of the validity of his judgments will find it difficult to find an equally experienced interviewer who will agree with him.

How Improve the Interview?—Many suggestions have been offered to make the interview more reliable. Among them the following have proved their worth:

1. Use the interview as a means of gathering facts and estimating objective and socially manifest qualities, not as a means of sizing up the entire person. Such qualities as speed of decision, originality of solution, accuracy of judgment, and capacity for logical planning can be disclosed during an interview if appropriate situations are selected to give the applicant an opportunity to show his capacity, but there is no assured way by which an applicant can reveal through an interview the strength of his capacity for loyalty, the evenness of his disposition, his power of cooperation under stress, or his moral qualities. The more subjective a trait is, the less reliable is another person's estimate of its strength. The interview may give an adequate basis for forming opinions on the applicant's appearance, manners, agreeableness, interests, hobbies, keenness in conversation, and attitude toward the type of work the organization offers; but it cannot tell how dependable, honest, or persistent anyone is or can be, nor can it reveal how he will stand up under the particular pressure the job demands.

2. O'Rourke has suggested some techniques[1] that can be incorporated in interviews. He suggests that after analysis has been made of the duties the job demands, the interview be used for solving especially devised problems that will sample the desired abilities. Having at hand a complete record of each response, the interviewer is given an opportunity to decide later upon the adequacy of the solutions. In one organization with which I am familiar a similar method was used with satisfactory results. Candidates for the position of sales manager were given a disagreeable letter from a customer and asked to dictate their replies. The opportunity for a display of tact, courtesy, and honesty presented in this situation allowed the applicant to show what would likely happen in similar situations if he obtained the position.

3. Some have suggested the use of a rating scale on definite qualities during or immediately after the interview. Roberts has found such a check to be valuable in his experience in hiring college graduates for the

[1] O'Rourke, L. J., Measuring Judgment and Resourcefulness, *Personnel Jour.*, 7: 427–440, 1928–1929.

Westinghouse Electric and Manufacturing Company.[1] Each candidate is rated on a 4 to 20 scale on each of five aspects: physical qualities, intellectual qualities, leadership promise, personal qualities, and general value to the company. Another illustration of such a scale is that reported by Milton Mandel[2] as a Civil Service Interview Form. A modification of that form is offered in Table 32:

TABLE 32.—OBJECTIVE FORM FOR THE ORAL INTERVIEW
Applicant's Name ____________

Quality to be judged	Meanings of extremes of the qualities	
a. Appearance, manner and bearing 1 2 3 4 5 6 7	Good health, much energy, tactful, inspires confidence	Nervous, uncertain of self, overbearing
b. Manner of expression 1 2 3 4 5 6 7	Pleasant and distinct voice	Stammering or monotonous voice, irritating
c. Facility and effectiveness of expression 1 2 3 4 5 6 7	Clearly, logically, and convincingly gets at essentials	Verbose, hesitant, undue time and emphasis on minor parts
d. Alertness 1 2 3 4 5 6 7	Gets meaning quickly; understands new and difficult ideas	Slow in understanding; loses sight of main point
e. Judgment 1 2 3 4 5 6 7	Weighs issues carefully	Makes snap judgments; is prejudiced and dogmatic
f. Initiative and interest in work 1 2 3 4 5 6 7	Evidence of wide reading in field; some research	No sign of having done anything beyond requirements
g. Originality or imagination 1 2 3 4 5 6 7	Evidence of new ideas when given problems	Resists thoughts not fitting into pattern
h. Summary evaluation	1 2 3 4	5 6 7

The value of such a form is that it provides the interviewer with a definite guide, and gives him specific issues on which evaluations are to be made. Estimates of some of these qualities are normally made in most interviews; the fact that an accepted form requires estimates on specific qualities that can be appraised with any degree of validity only by means of the interview compels the interviewer to create situations in which it will be possible to compare the responses of different candidates. The form that these situations will take varies from one company to another and from job to job in the same company; no interviewer will look for much originality in candidates for filing jobs and for evidence of initiative among candidates for the position of porter. The extent to which emphasis will be placed on any one or on any number of qualities

[1] ROBERTS, E. B., Selecting and Placing Technical Graduates in the Westinghouse Organization, *Management and Administration*, 6: 207–211, 1923.

[2] *Personnel Jour.*, 18 (No. 10): 300, 1940.

depends on the extent to which the positions for which candidates are being hired are likely to demand its expression. The quality content of the oral-interview form will and should be governed by the major demands of the functional category in which the job falls.

4. A promising suggestion is given in another of O'Rourke's studies.[1] In his supervision of an investigation of applicants for one type of government service he selected a number of key questions prepared for the interviewer to ask, and, anticipating the answers, wrote them under the questions. When interviewers had been given 2 weeks' training in conducting an interview, their judgments of the value of the replies were taken and compared with those of interviewers who had had no training. The amount of agreement in the matter of ranking the candidates was considerably higher among the trained than among the untrained interviewers. Even the capacity to compare the spoken and the written reply needs training. The selection and training of interviewers is as essential a part of employment procedure as is the standardization of application blanks and trade questions.

5. In many companies it is a common practice, when selecting candidates for the more responsible positions or when making selections of college graduates who are to be trained for responsible positions, for a number of executives, in addition to the members of the employment department, to conduct an interview and submit independent reports to a central committee. The object in such a multiplicity of interviews is to gain the impressions of a number of people with whom he will be likely to have many contacts if he is hired, and to supplement the information that may be gained through the channels customarily used by the employment department.

The value of this multiple interviewing depends on the skill of the interviewers; while it is true that two bad eggs will not make a better omelet than one, it is also true that queries will vary with different interviewers, and that each interviewer tends to center his queries around issues on which his past underlings have fallen down. The validity of this approach cannot be appraised until studies are completed on those who have been selected and worked in a number of situations for a number of years; that it is one of the most expensive of selection methods is commonly recognized.

The Exit Interview.—Another important part of the job of interviewing—one that is becoming increasingly common in modern personnel departments—is the exit interview. If some record form is used so that the gathered information may be assimilated, this interview can serve any or all of the following purposes:

[1] O'ROURKE, L. J., *A New Emphasis in Federal Personnel Research and Administration*, pp. 19–21, Government Printing Office, Washington, D. C., 1930.

a. It can give information on the causes of leaving, whether they are personal grievances and misunderstandings, arbitrary decisions on the part of foremen or superintendents, or unsatisfactory working conditions.

b. It can give the personnel department an opportunity to be of greater service to its force; often there are unsatisfactory personal or home conditions which a worker by himself cannot remedy, but which the staff in an organization can help to cure.

c. It can act as a check on hasty and impetuous decisions on the part of minor executives. Miller[1] reports the practice of one employment manager in a large manufacturing plant: "When I learn of a man's grievance or misunderstanding, I call in the foreman to hear what he has to say. . . . the man doesn't stay, because we have to back up the foreman to preserve discipline, yet when a similar case comes up, the foreman thinks before he discharges the man."

d. It can also be used to remedy undesirable working conditions. The personal complaints of one quitter may be of no significance, but when the same situation recurs in complaints again and again, there is sufficient evidence of, and opportunity for correcting, poor conditions, whether they be those of physical environment or purely personal.

e. Then there is the opportunity the exit interview gives for establishing or maintaining employee good will, for clarifying some of the company's policies, and for assisting in adjusting the person to a new field of work in the same or another organization.

The information gathered in the exit interview will be most valuable if it is secured in a systematic manner and assimilated when time and a sufficient number of cases justify the task. A form that is workable and that lends itself to easy tabulation is given in the following "Termination record blank." It is patterned after a similar one suggested by Kenagy and Yoakum[2] for interviewing the quitting salesmen.

TERMINATION RECORD BLANK

(To be filled out for each employee leaving the company)

Name____________________Date employed________Date leaving________

Production record during each of his last six months (or weeks):

First month__________Second month__________Third month__________

Fourth month__________Fifth month__________Sixth month__________

Position held____________________Department_

1. Why did he leave? Voluntarily ( ). At foreman's request ( ). Because of lack of work ( ).
2. Was his termination caused by any of the following? Old age ( ), ill-health ( ), removal from locality ( ), better job elsewhere ( ).
3. Was it caused by any of the following? Foreman's attitude ( ), dislike for fellow workers ( ), disagreement with company's policies ( ), too great a strain on some part of his body ( ), poor physical working conditions ( ), rate of pay ( ), other grievances ( ), *e.g.*,
4. Was he reported unsatisfactory for any of the following reasons: irresponsible ( ), unreliable ( ), uncooperative ( ), a complainer ( ), an agitator ( ), other, *e.g.*,

[1] MILLER, L. R., Why Employees Leave: Company Records and Analysis of Causes of Exits, *Jour. Personnel Res.*, 5: 298–305, 1926.

[2] KENAGY, H. G., and C. S. YOAKUM, *The Selection and Training of Salesmen*, pp. 211–213, McGraw-Hill Book Company, Inc., New York, 1925.

5. What was his statement of his reason for leaving?
6. What was the foreman's statement of the reason for leaving?
7. What was his financial record while with the firm? Reported borrowing ( ); pay envelope seized: once ( ), occasionally ( ), frequently ( ); no indication of financial stress ( ).
8. Did he offer any constructive suggestions while with us? Yes ( ) No ( ).
9. Was his obvious reason for leaving the same as his reported reason? Yes ( ) No ( ).
10. What is his attitude toward the company?
    - *a.* Would he advise anyone else to work here? Yes ( ) No ( ).
    - *b.* Does he think well of promotional policy? Yes ( ) No ( ).
    - *c.* Would he want to work again in the same department? Yes ( ) No ( ).
    - *d.* Has he any suggestions for improving working conditions, inequalities, rate of pay, supervision, training? Yes ( ) No ( ). If so, What?
11. What does he plan to do? New job ( ). Anxious for help in locating one ( ). No plans ( ).
12. Would you reemploy him? Yes ( ) No ( ).

The completion of such a form has considerable value when, 2 or 3 years later, there comes a request for a recommendation. The production record in the possession of most present-day employment offices will not give an adequate picture of the promise the worker has for another organization. The same holds true if at any future time the same person should seek work in the same, but probably reorganized, company.

This discussion of the task of interviewing has been limited to the type necessary for employment and discharge purposes. The forms it should take and the value it has when the object of interviewing is job analysis, or instruction, or adjustment, or the discovery of workers' attitudes are necessarily different and will be reviewed in the chapters in which these various topics are discussed.

Topics for Report

1. Compare the application blanks of any three companies. Select:
    - *a.* Their points of difference.
    - *b.* The items that are of most significance in each case.
    - *c.* The parts that are of no significance.

2. Make up an application blank that will be within the realm of probable value for hiring occupants for any one of the following positions: real estate subagent, bank clerk, teacher of commercial subjects, accountant, private secretary, salesclerk.

3. Make out a recommendation form similar to, or patterned after, that suggested on pages 83–84 for any one of the positions suggested in topic 2.

Required Readings

1. BINGHAM, W. V. D., and B. V. MOORE: *How to Interview*, 2d ed., pp. 79–110, Harper & Brothers, New York, 1941.
2. MOORE, B. V., and G. W. HARTMANN: *Readings in Industrial Psychology*, pp. 93–128, D. Appleton-Century Company, Inc., New York, 1931.

3. VITELES, MORRIS: *Industrial Psychology*, pp. 169–199, W. W. Norton & Company, Inc., New York, 1932.

Supplementary Readings

1. Interviewing Applicants in Public Employment Offices, *Employment Office Manual Series*, Section I, U. S. Department of Labor, Washington, 1935.
2. HOLLINGWORTH, H. L.: *Judging Human Character*, D. Appleton-Century Company, Inc., New York, 1923.
3. LAIRD, D. A.: *Psychology of Selecting Men*, McGraw-Hill Book Company, Inc., New York, 1927.
4. HEPNER, H. W.: *Psychology in Modern Business*, pp. 193–228, Prentice-Hall, Inc., New York, 1930.

CHAPTER V

TESTING THE APPLICANT

Psychological tests have been in use in industry for more than a quarter of a century; they have been known to nearly everyone since the First World War, when the use of them stirred up approval and scorn, wide support and fierce criticism, great promise and blasted hopes. Solely on the basis of their results, candidates for positions were eliminated, aspirations for advancement were nipped in the bud, and glowing hopes of fond parents were shattered on the rocks of the cold realities of test scores. In the heyday of their popularity, business forsook the glamours of characterology, and rushed to an equally promising short cut for selection—the mental test. Educational psychologists, however, did not join in the wide acclaim that greeted the introduction of this kind of test, and before long it seemed to the industrialist no more fruitful or reliable than were the systems of characterology and physiognomy temporarily eclipsed by it. This attitude resulted in its being deserted. For the past decade psychologists have been trying to heal the wounds that adolescent enthusiasms incurred, and to establish the mental test among the technical, scientific tools of value to industry. Today both business and industry are adopting these tools, in a questioning mood but with ever-increasing approval.

CIVIL SERVICE COMMISSION'S USE OF TESTS

The experience of the Civil Service Commission, in its attempts to evaluate applicants by means of tests and examinations, is typical of the trial-and-error procedure of many industries during the past quarter of a century. Their efforts have taken four forms, two of which are still being used.

1. Examination in Terms of School Subjects.—From 1883, when the commission was organized, until the beginning of the present century, the type of examination for all positions, from clerks to policemen, was the same, the only difference being a variation in the subject matter. Such school subjects as arithmetic, spelling, composition, penmanship, and grammar served to differentiate among all classes. Checkup of selections, however, showed a high percentage of inefficiency and, as a result, a second method was adopted.

2. Essays in Terms of Jobs.—Questions were asked which had some bearing on the job, and answers were of the essay type. This appeared satisfactory, as it seemed to be practical and to have some relation to what the job demanded. The difficulty common to all essay types of examination, however, was soon apparent, *i.e.*, difficulty of evaluation. After the development of mental tests during the First World War, the commission tried out some of the Army tests, particularly the Army Alpha, and in 1922 it appointed a research division to establish standard methods of evaluation. Numbers of mental tests for various kinds of positions were developed, and before long there was adopted a type that was found useful in the Army as a supplement to the Alpha Test—the special aptitude test.

3. Special Aptitude Tests.—These tests immediately came into favor, as the terminology of the test was related to the demands of particular jobs, and when they were well constructed and standardized they showed distinctions that corresponded with subsequent experience. An illustration of such a test is that devised by Telford and Moss[1] for selecting policemen. The test has four parts:

a. Observation. The applicant is given a streetcar accident picture to study for 3 minutes, and later is asked questions on minute details of the scene.

b. Memory. From a group of 40 pictures the applicant has to select 20 that he has previously examined.

c. Comprehension. The applicant is given selections from laws, ordinances, and police regulations, and after a set time for studying them, is asked a number of questions on their content.

d. Judgment. The applicant is given representative situations and alternate solutions for each situation, one of which he is to select as the best, *e.g.*, "If a policeman considers himself unfairly treated by the sergeant, and gets no satisfaction when he explains to the sergeant that he is not fairly treated, he should:

______Refuse to obey orders given by the sergeant.

______Invite the sergeant to meet him when both are off duty, so that they can settle the matter themselves.

______At the first opportunity report the matter to his lieutenant or captain.

______Immediately hand in his resignation."

Similar types of tests have been devised for a number of occupations, and have resulted in a more intelligent selection than when complete reliance was put upon the results of a mental test alone.

4. Trade Tests.—A supplementary type of test for some positions, particularly for mechanical workers, has been devised—the achievement or trade test. This has been and is being used as a check on reported experience, and is given to applicants for positions that require technical training.

[1] TELFORD, FRED, and F. A. MOSS, Suggested Tests for Patrolmen, *Pub. Personnel Studies*, 2: 112–113, 1924.

INTELLIGENCE TESTS IN INDUSTRY

The U. S. Civil Service Commission has been a little in advance of industry in its use of intelligence tests, but in one form or other tests have worked their way into industry, and are being welcomed today by the scientific industrialist with greater eagerness and enthusiasm, and with a better understanding of the particular value that well-constructed and well-standardized tests may have, than at any previous time in their history. Surveys show that increasing recognition is being given to their possible contribution. In one survey made by the National Industrial Conference Board[1] in 1936, 179 out of 2,452 companies reported using tests for various purposes, and in a survey of 195 concerns made by S. B. Mathewson,[2] 17 per cent reported using mental tests, 27 per cent using trade tests, and 45 per cent using clerical and stenographic tests. Among these organizations were many with international reputation for quality production. In another survey of 245 concerns, 153 of which gave oral or written replies, Douglas Fryer[3] obtained the results that are given in Table 33.

TABLE 33.—THE USE OF TESTS IN 153 CONCERNS

Organizations	Country wide	New York City	Total
Number giving information	105	49	154
Number now using tests	12	10	22
Number who have used tests	7	7	14
Number interested in starting the use of tests	21	0	21

Fryer also reports that 14 per cent of the firms that had had any experience with any type of test had subsequently introduced a general-intelligence-testing program, and he estimates that there are now 300 commercial and industrial firms in the United States using intelligence tests.

The value of tests can be indicated by a report given by G. W. Wadsworth,[4] who has had considerable experience with their use in a large utility organization and who says: "Intelligence tests can be applied in a service organization in such a way as to multiply chances of successful selection. Scores in these tests do not tab or earmark applicants who

[1] What Employers Are Doing for Employees, N.I.C.B. *Report,* No. 221, March, 1936, p. 24.

[2] MATHEWSON, S. B., A Survey of Personnel Management in 195 Concerns, *Personnel Jour.,* 10: 225–231, 1931–1932.

[3] FRYER, D., Intelligence Tests in Industry, *Personnel Jour.,* 13: 320–323, 1934–1935.

[4] WADSWORTH, G. W., Tests Prove Their Worth to a Utility, *Personnel Jour.,* 14: 183–187, 1935.

will invariably succeed, but selections made within favorable score ranges increase the percentage of success."

In proof of their value Wadsworth gives the following table, based on experience in the company in which he works:

TABLE 34.—A CONTRAST BETWEEN TESTED AND NONTESTED EMPLOYEES

Types of employee	Nontested employees, per cent	Tested employees, per cent
Outstanding employees...	22	33
Satisfactory employees....	49	61.5
Problem employees.......	29	5.5
Total in the organization..	594	108

The student of tests today is no longer concerned with their possible value and importance, nor is he disturbed by the occasional cynic who discards them as devices of the propagandist; he knows, or at least he ought to know, that their value depends on the user as well as on the test, and that the same discrimination and method of standardization are necessary for the construction and use of that tool as are necessary for the establishment of any scientific instrument.

It is true that the tester often does not know what he is testing and that many of the factors that he would like to test he cannot explore, and that he has no hopes of getting any one test that will select candidates for all occupations, or even for one. E. G. Williamson says:[1] "As far as present knowledge goes, there is no one aptitude test for a particular occupation. Many types of tests are necessary to measure aptitude for such a complex type of work as that performed by a mechanic. Each occupation requires many aptitudes, and many jobs require similar aptitudes."

To do his job well, the mental tester must analyze his elements, just as the chemist does. Some of these elements later turn out to be compounds; some of them are so intertwined with so many other factors that he cannot untangle them; and some of them are so intermingled that he has to jumble them all together and measure a "general" factor, quantity, or element. He is an explorer, but an explorer today with sufficient experience to establish some claims, and with a vast field of unexplored territory, which patient research is gradually delimiting.

Purpose of Tests.—The part that tests may play in the employment situation depends upon the fertility of the person in charge of tests, the care with which tests are introduced, the tactfulness with which their legitimate interpretations are conveyed to the candidate and the employment manager, and the discrimination that the test administrator shows

[1] WILLIAMSON, E. G., On Choosing a Vocation, *Occupations*, 14 (No. 7): 638, 1935.

in his use of time and ability in selecting standardized tests that appraise types of abilities that are needed in specific situations, and in exploring new fields that present problems to the employment office.

The contribution that tests make to the employment problem varies in different companies and in different types of selection situations; the variation depends on a number of factors:

1. *The Extent to Which Management Is Personnel Minded.*—To management, tests are on a par with the application blank and the recommendations as selection tools; when relatively short-cut procedures, already established, produce apparently satisfactory results, the addition of another time-consuming and relatively expensive tool seems unnecessary; and even when labor turnover reaches disturbing proportions it is not always evident that the cause is inability, superior ability, or unadaptability. The obvious difficulty that some employees have in acquiring necessary skills, the frequent errors that are made by those who are attempting to do work for which they are not fitted, and the frequent requests for transfer to a different type of work from that in which employees have been engaged in a 2- to-3-year training period have convinced many in management that the usual selection tools have fallen down on the job. Until there is internal evidence that tests can meet a demand that present selection procedures fail to meet, lukewarmness or even antagonism is to be expected from management.

2. *The Caliber of the Test Administrator.*—Except in a very few organizations, where the test division is on a par with the medical department and even extends beyond that in embracing some of the functions of the research division, the test administrator plays a relatively minor part in the employment division; frequently the task of administering tests is relegated to clerks who have had a few courses in psychology in college and who know very little about tests beyond the names of a few that have been administered to them. In such cases the tests that are used are chosen because of the proclaimed merits of the test, without any regard to the demands of the situation or to the injustice that an improperly selected tool may do to an aspiring candidate. For tests to be effective, the test division must play quite as significant and as expensive a part in the selection problem as does the medical division; and if full use is to be made of tests in selection, transfer, promotion, and adjustment, the test division must be put in the same category as the research division—from which frequently but little is expected until years of study and considerable expense have shown conclusive proof of possible value. The results that can be gained from tests are impossible when ready-made tools are expected to be placed on a table overnight, and when test-minded clerks are entrusted with the responsibility of selecting and administering the tools. The adoption of this practice has been one of the

most frequent causes of "tryouts" and "discards." Unless and until the use of tests is placed under the direction of psychologists who are trained in job study and in the art of handling people, the place of tests in the employment office should be usurped by such short-cut methods as are easy to master and more quickly susceptible to discard.

Granted the presence of personnel-minded management and competent test administrators, what purpose may tests serve? In the employment office they serve but two purposes: to help eliminate the unfit and to locate the fit. In subsequent phases of the employer-employee relationships they play other parts—choosing those who are worthy of additional training, aiding in deciding the types of training that should be given, spotting those who may be given positions of supervisory responsibility, selecting those who may be transferred to or from contact positions, and diagnosing those who are falling below standard or previous-record levels; these functions belong to their province after the employment problem has been solved; the extent to which they can offer a contribution will be noted in later chapters.

Types of Tests.—The tests that are available or that are commonly constructed may be placed in a number of categories:

1. General ability, special ability, achievement (school or trade), interest, and personality are the major categories, when a classification is made in terms of an analysis of the self.

2. *Group* and *individual* are the classes when tests are grouped in terms of administrative problem.

3. *Time* and *power* are the names when the grouping is in terms of speed and ability.

4. *Verbal* and *nonverbal* are the classes when tests are grouped in terms of types of contents.

5. *Subject* or *position* is the name assigned to tests when they purport to measure level of achievement or particular promise.

The concern of the employment manager is not so much with the type of test as it is with the extent to which the test measures the level of ability and promise that the job demands, and the extent to which a particular combination of abilities is necessary in order that the particular skills and combinations of movements may become habitual within a relatively short time.

In order that tests may be of value to the employment manager, at least three types are necessary in every hiring situation:

a. General level of ability tests.
b. Special ability tests.
c. Personality and interest tests.

The extent to which they may give aid in the employment situation is the problem with which this chapter is concerned.

GENERAL ABILITY TESTS

The ability levels that jobs demand are not unknown to employment managers; experience in the work situation and the job descriptions that are frequently supplied have provided him with information on the basis of which he has already classified the jobs into at least three groups: those that can be filled by grade school graduates, those that need a high school background, and those that need some type of college training. His object in using the results from tests of the general ability type is to find out whether or not the person with a limited educational background is capable of advancing beyond the elementary stage of skilled or semi-skilled work, and if the expenditure that additional company-sponsored training will involve is warranted. The level of ability of the candidate gives the employment manager one sign of the applicant's future promise.

In order for that sign to be reliable, the discriminating tester in the employment office will not be content with one general ability test; the applicants who confront him will be applying for every type of position, below the executive level, in the organization; some will have had a limited educational background, others will have had a limited social background, others will have had but little acquaintance with the English language, and others will have physical handicaps that make the use of one general test impossible. To use tests properly, the tester needs batteries of tests for as many categories as there are patterns of occupations in the organization. To equip himself adequately with this collection he needs to be familiar with the theoretical basis on which particular tests have been constructed.

In general, the mental ability tests are constructed on one of two basic assumptions.

1. The first of these assumptions is that candidates have been in an environment where they have been subjected to a number of educational and social stimuli, because of which they have acquired a certain fund of knowledge. An adequate and statistically reliable cross section of that knowledge ought to sample what has been acquired, and the level of acquisition is assumed to be an index of what can and what may be acquired. Many of the verbal tests are of this nature; samples of information are taken from vocabularies, from geography, from arithmetic, from current events, from history, from Emily Post, and from the almanac, and after a large collection of items has been given to students at the various educational levels, the norm for each level is established; the extent to which an applicant approximates that norm is taken as an indication of his level of ability.

To this type of test the employment manager has some objections:

a. Many of his applicants have had varied educational opportunities and a limited social environment. To judge their promise in terms of the level of attain-

ment gained by the so-called average person frequently does injustice to candidates with a different educational background and with limited possibilities for becoming familiar with the social, historical, or factual contents of a test. For example, how many applicants who have acquired their speaking knowledge of English in adult evening classes know that Cornell is in Ithaca? But such items of information place candidates in categories of promise, if the results from tests such as these are to be accepted.

b. Many of the employees in the organization have reached positions of responsibility and are doing work that requires a high degree of skill, yet have fallen down on such tests as these. It is very true that isolated cases form the basis of the objection, but that does not discount its significance to the manager. A hasty categorizing of positions in an organization on the basis of sample representatives, to whom has been administered a test that has been standardized in the educational world, spells defeat for the test or results in the loss of many valuable candidates to management.

c. The tests do not have any relation to the types of problems with which the future worker will be confronted. It may be true that the test indirectly appraises functions that the job will demand; it is also true that a test that indirectly appraises the strength of one function—*e.g.*, memory—rests on the assumption that it appraises that function as a general capacity that manifests itself in approximately equal proportions in all types of situations and with all types of problems. Research and practical experience speak otherwise. Memory for names is not necessarily at the same level as memory for street addresses, for mathematical formulas, for poetry, or for history. The function with which the employment manager is concerned is that called for by the particular demands of the job situation; to infer that good memory level, as indicated by a test of memory, will give a reliable criterion of the adequacy with which demands on memory of an entirely different type from that appraised by the test will be met, is rarely warranted.

This does not discount the value of tests that rest on the assumption that a cross section of present knowledge is an indication of promise; for some types of situations it is a reliable index; repeated proof is available of the merit of such tests in hiring people for some contact types of positions that put demands on previously or readily acquired verbal knowledge.

2. The second basic assumption in testing mental ability is that a measure of general level of ability should draw as little as possible on previous knowledge; instead, it should give the candidate an opportunity to display his capacity for using his higher mental capacities, especially his reasoning ability and his ability to make fine distinctions between closely similar pictorial or graphic presentations. This assumption has been basic to the nonverbal tests and to some verbal tests.

To this type of test there are the following objections:

a. It rests on the assumption that candidates are visual-minded, and can think in third-dimensional terms. While visual imagery has repeatedly been shown to be the most common type, there are many applicants who think in terms of movements, sounds, and tactual sensations, and there are many others who cannot grasp the significance of tridimensional forms.

b. It is difficult to construct nonverbal tests that will differentiate people at the adult or the mature superior level. Such attempts as have been made to construct

tests of this kind have been most successful when they have been limited to appraising the strength of one function; as appraisers of general ability they exist as hopes and promises.

In some employment situations both of the above assumptions are made; on the basis of one, tests are used for selecting candidates for positions in which there will be a demand on the verbal factor; and on the basis of the other, candidates for operating positions are chosen. The tests that are used are of two main types:

a. Omnibus or cyclical, and usually self-administering.
b. Battery, and usually administered by another person.

Both these types of tests are timed so that the most brilliant testees at the age and educational level for which the test was standardized can rarely complete the series; this technique goes on the assumption that the speed with which information can be recalled and recorded indicates the mental alertness of the candidate. Tests for which no time limit is set, but which combine the time spent by the candidate with the number of errors and omissions, are usually "power" tests, and are less frequently used as measures of general ability than they are as measures of special promise.

Omnibus Tests.—The omnibus or cyclical tests usually consist of a number of types of material similar to those used in battery tests, but arranged in cyclical patterns of increasing levels of difficulty; they are usually constructed as sequels to battery tests and comprise items that have been found of most value in sections of whatever battery test has been used as a base for the supply of the test material. The most commonly used omnibus tests in the employment office are the following:

a. Bureau Test VI, a 15-minute test based on the Army Alpha.
b. The Otis S-A Test, a 20- or 30-minute test, resembling Bureau Test VI.
c. The Personnel Test, a 12-minute test using the most valid items in the Otis S-A Test.

Less frequently used omnibus tests are the O'Rourke General Classification Test, the Henmon-Nelson Tests of Mental Ability, the Pressey Senior Verifying Test, and the Pressey Senior Classification Test.

The popularity of such tests is due to the fact that they are easy to administer, correct, and interpret; a clerk in the employment office can take care of administering and scoring the test to one promising candidate while the employment manager is giving an interview to another candidate, and the results can be available within a relatively short time. Norms are suggested for various types of workers, and labels that indicate promise of work range are easily attached.

The dangers to which such tests are heir are as follows:

1. The score represents the composite of achievement in four to six types of problems and phases of information. Usually the problems are of fact or reason and the information is such as has been easily accessible to those who maintain an interest in significant happenings. Anyone whose chief field of interest has been different from those sampled by the test is necessarily handicapped.

2. The occupational norms that are provided are necessarily general; even when they are based on large samples of workers in the different occupations, they are subject to errors of sampling, errors of time, and errors that are inherent in the nature of the occupations or trades that go by the same name in different companies but that carry different responsibilities in different places. For example, to establish norms for office clerks is meaningless unless the specific duties of the clerks that form the experimental groups are the same as those for which candidates are selected; and to compare the score made by a would-be office clerk with "office-clerk" norms conveys very little significance unless the duties are comparable with those of the office clerks on whom the norms have been established. If the norms are to have any significance they must be locally established in terms of the levels gained by the different types and classes of workers in the organization in which the test is to be used.

3. The over-all score gives no opportunity to appraise the relative weakness and strength of the candidate in those aspects of ability that the tests measure. Situational demands are specific; failures are due to definite weaknesses; for the test to forecast probable achievement, it must give an indication of those phases of the work on which the applicant will fall down. True, there are situations where general ability, rather than specific, is the most important asset; many of the crucial parts of the more elementary contact jobs depend, for their successful carrying out, on general rather than on specific mental qualities, and for these the level of ability that is indicated by such a test undoubtedly has worth. When, on the other hand, the job demands are specific, varied, and dependent on the exercising of particular abilities, the general score is not nearly so valuable to an employment manager as the specific score that represents levels in important functions.

Battery Tests.—The battery tests that are used as measures of general ability consist of a number of subtests, each of which attempts or purports to measure one capacity; from the results an over-all score is provided to give an indication of general level, and subtest scores provide an opportunity to compare levels of promise on the different capacities as well as levels with standard groups. Their value to the employment manager is determined by the specificity of the groups on whom the tests

have been standardized; the relative ease with which they can be administered, scored, and interpreted; and the closeness with which the contents of the subtests relate to and appraise the capacities that are needed in the position for which the candidate is being considered.

TABLE 35.—CAPACITIES MEASURED BY TESTS

Capacity	Aspect
1. Discovering relations	*a.* Between verbal or pictorial terms
	b. Between elements in unitary situations
2. Making judgments	*a.* Of spatial fitness and relations
	b. Of symbolic or verbal relations
3. Amount of knowledge of	*a.* Facts of a simple order
	b. Facts of a difficult order
4. Learning speed in	*a.* Making simple combinations from immediate observations
	b. Making simple combinations from delayed instructions
5. Degree of familiarity with	*a.* Simple number compounds
	b. Word spellings
6. Accuracy of observation	*a.* Of paths through complex patterns
	b. Of errors in pictorial representations
	c. Of small differences, changes, or omissions
7. Reasoning ability applied to	*a.* Mathematical problems
	b. Common, everyday occurrences
	c. Number or word sequence
	d. Inadequate pictorial or verbal representations
	e. Appearances of changed shapes, sizes, or weights
	f. Logical sequences or thought contents
8. Understanding and following directions	*a.* Appearing in the form of simple, single directions or in the form of multiple questions
9. Vocabulary	*a.* Finding opposites
	b. Finding equivalents
	c. Word usage

The capacities that are appraised by such tests may be indicated if samples of material that form the contents of such tests are given. In Table 35 there is a numbered summary of the capacities that are appraised by sections of some adult intelligence tests. It should not be assumed that these capacities are regarded as specific entities, that they exist as isolated units, or that their strength can be adequately appraised by the type of material that is given in the table. No one has yet succeeded in isolating any capacity, still less is there an undeniably reliable tool for measuring it. Capacities are interwoven, and are affected by crosscurrents from emotional, physical, and experiential forces. To name a capacity is not to imply its isolation; rather, it is to

indicate the type of material that has been found of value in making a rough estimate of the level of achievement that the conjunction of forces represented by the capacity has made possible. The isolation and identification of these capacities await further experimental work from the factor analysts.

From Table 35 it will be seen that the attempts to measure general level of ability consist of selected measures of a number of psychological functions; no test includes all of them; some place more importance on estimates or aspects of one capacity than on another, and other tests sample a variety of capacities on the assumption that the wider the sample the more reliable is the result.

The tests that are most commonly used at the adult and late adolescent level are listed in Table 36. In the second column will be found the major divisions of the tests in terms of the division in Table 35; in the third column are some comments to indicate the distinguishing feature of the test.

The above list of tests comprises those available to the employment manager; but which should be used? The choice of a test depends on a number of factors which should be considered before any general and well-standardized test is adopted.

1. To what extent do the contents of the test appraise the aspects of ability that are important in the position for which candidates are to be selected? The assumption that any well-standardized test will suit the purpose has been one of the chief causes of lack of confidence in the results from tests; for tests to supply the most clinical value to the employment officer they must give approximate appraisals of the functions that are important in the job. If the jobs place a heavy demand on verbal facility, tests that are weighted with the verbal factor will likely be of most value; if the demands are on judgment, tests of reasoning will likely be of most value; if the demands are on motor coordination and steadiness, tests that appraise motor skill and visual discrimination will likely be of most value. The more closely the contents of the test parallel the job demands, the more valid it is likely to be. The appraisal will not and cannot be exact, for the contents of no test are exact duplicates of job demands; however, the probabilities that the test will appraise those capacities that are of importance in the job are increased when its problems resemble those that are to be attempted on the job.

2. To what extent does the test depend on educational background? In spite of the fact that tests are often interpreted as measures of native ability, the majority of tests give only approximations of that; if native ability is indicated by level of educational achievement and by the speed and accuracy with which what has been learned can be recalled and recorded, then most of the tests give an appraisal of native capacity.

TABLE 36.—NATURE OF CONTENTS OF BATTERY TESTS

Name of test	Contents	Comments
A. Army Alpha Form 5 (Wells)	1*a*; 3*a*; 5*a*; 7*a*, *b*, *c*; 8; 9*a*	Depends very little on previously acquired information
B. Army Group Examination, Forms *A*, *B*, *C* (Schrammel)	1*a*; 3*a*, *b*; 7*a*, *b*, *c*; 8; 9*a*	Combines significant parts of the original Alpha
C. The Army Alpha Examination, First Nebraska Revision (Guilford)	1*a*; 3*a*, *b*; 7*a*, *b*, *c*; 8; 9*a*	The results are grouped in terms of three factor loadings: verbal, numerical, and relational
D. Revised Beta Examination (Kellogg)	2*a*; 4; 6*a*, *b*, *c*	Test does not depend on acquired knowledge
E. Test of General Knowledge (Benge)	1*a*, *b*; 3*b*; 5*a*; 7*d*; 9*b*	Not used in educational circles; norms for high school graduates
F. California Test of Mental Maturity, Advanced Series (Tiegs *et al.*)	1*a*, *b*; 3*a*, *b*; 4*a*, *b*; 5*a*; 6*a*; 7*a*, *b*, *c*; 9*b*	Memory, spatial relations, reasoning, and vocabulary are the chief functions appraised. Profile results
G. Cattel Intelligence Tests, Scale III, Forms *A* and *B*	1*a*; 7*d*, *f*; 9*a*, *b*	Major emphasis is on reasoning; minor sections only depend on acquired knowledge
H. Vocational Aptitude Examination, Type *E-A* (Cleeton and Mason)	2*b*; 3*a*, *b*; 7*a*, *f*; 9*b*	A predominantly verbal ability test is supplemented by a short interest and personality questionnaire
I. Detroit General Aptitudes Examination, Form *A*	1*a*; 2*b*; 4*a*; 5*a*, *b*; 8*a*; 9*a*, *c*	Ten parts of a 15-section test attempt to measure general intelligence; norms for grades 6–12; classified into motor, visual, and educational
J. George Washington Mental Alertness Test (Center for Psychological Service)	3*b*; 4*a*; 7*a*, *f*; 9*a*	Predominantly verbal; emphasis on delayed memory
K. Kuhlmann-Anderson Tests, Grade IX—Maturity	1*a*; 3*a*, *b*; 5*a*; 7*a*, *c*; 8; 9*b*	Form part of a school test battery; predominantly verbal
L. National Intelligence Tests, Scale *A*, 2 forms	4*a*; 7*a*, *c*; 9*a*, *b*, *c*	High correlation between all forms in spite of differences in content; predominantly verbal and used educationally
Scale *B*, 3 forms	1*a*; 3*a*, *b*; 5*a*; 6*c*	
M. Terman Group Test of Mental Ability 2 forms	1*a*; 3*a*, *b*; 7*a*, *b*; 9*a*, *b*, *c*	Considerable use of acquired information
N. Roback Mentality Tests for Superior Adults	1*a*; 3*b*; 6*a*, *c*; 7*d*, *f*; 8; 9*a*, *c*	Ingenious and difficult; emphasis on reasoning ability

If, on the other hand, one's educational record and level indicate what could not well be avoided, the tests that make considerable use of educational material are but cross-sectional substitutes for academic examinations. To assume that such tests are accurate indexes of promise is to assume that what one has achieved is a reliable indicator of what one can and will achieve. Repeated instances of exceptions that are furnished by employment managers tend to invalidate the assumption; and numerous cases of those who, under the spur of different goals, different motivational forces, and different sponsors, have achieved levels that are far beyond those promised by past achievements tend to dispel confidence in such tests. Recognition of this danger in tests is made by many test constructors and attempts have frequently been made to construct tests that are independent of previous knowledge; such tests as the Revised Army Beta, sections of the various revisions of the Army Alpha, the Cattell tests, and the Roback Superior Mentality tests represent advances in this direction.

3. To what extent have applicants had an opportunity to become familiar with the test? Many standardized tests are in use in school systems, many are purchasable, and parts of others have received wide publicity through newspapers and national magazines. Purchasable tests that are used in an employment office are exposed to the danger of coaching and practice; the percentage of applicants who are already familiar with such tests before entering the employment office is unknown; estimates by employment managers vary from 0 to 15 per cent. The fact that the danger exists is sufficient justification for the construction and standardization of an independent test in each company that has a test-research department.

4. What are the chief factors in the employment position for which the candidate is being considered? If the job is of a semiskilled type that offers little or no promotional possibilities, the use of a test is to eliminate those who will speedily master and outgrow the job demands. For many types of semiskilled work the chief contribution of general tests is in the help they give management to avoid those who are too intelligent for the position; if the semiskilled jobs are a necessary preparation for the more advanced jobs, the general tests indicate those who may be worth training. If the present occupants of jobs have been subjected to the same test, a comparison of the candidate's score with those made by critical group levels gives one indication of the potential level of the candidate.

THE USES OF GENERAL ABILITY TESTS

1. To the employment manager general ability tests have two values: they weed out those who are unfit for the ability demands of particular jobs, and they help categorize those who may be absorbed in the organi-

zation. Their value depends on the type of test that is used; if the omnibus test is chosen, its value is very limited. It serves to give general impressions that are slightly more valuable than those gained by the interview or by any other short-cut method of appraisal, but they still remain general. The demands of the employment office are specific; if the tests are to produce the values of which they are capable, specificity rather than generality must characterize their disclosures. To realize this value the battery test that produces a significant profile for and in terms of the job demands will be of most value. In organizations where job specifications have resulted in job rating scales, the bases on which significant test profiles should rest have been provided; the extent to which the test in use produces a profile that is related to or corresponds with the job profile determines the value of the test to the employment manager.

2. There are other values that battery tests may produce. Most jobs have key demands; some of these are in the field of verbal fluency, others are in the realm of mathematical facility, others in the realm of the ability to notice details, and others in system, order, neatness, etc. Battery tests are of value in locating those who may have specific strengths in the demands that are peculiar to a job, at the same time that the general score on the same test may be at a low level. Many jobs have more monotony than variety; in the constant and accurate care of constant and monotonous demands, the exercising of one specific type of ability is of more importance than the exercising of a high general level of ability. The test that is constructed to appraise the peculiar demands of particular groups of jobs will be more meaningful in the employment office than the test that labels a candidate as belonging to any one work level.

Somewhat similar to its value as a means of locating job fits is its value for clinical and guidance purposes; the profile, when reliable and valid, indicates the danger zones. The extent to which they can be remedied varies according to the nature of the function; when, for example, there is evidence of good reasoning ability with mathematical problems, and that ability promise is impaired because of unfamiliarity with simple arithmetical compounds, the remedy is in the direction of practice with simple number combinations; when the weakness is in such fields as noticing details, perceiving essentials, or reasoning logically, the remedial process is more difficult and can rarely be undertaken by the industrial organization.

3. The other chief value of tests to the employment manager is in the field of training and promotion. General tests have shown their most satisfactory use in aiding the selection of those who are promotable and who are obliged to absorb job knowledge and job skill in order to win

promotion. The selection of those who are trainable is as important a part of the work of the personnel department as is the selection of those who are fit or easily prepared for beginning jobs. The extent of one's trainability is largely determined by the level of one's general ability; the ease with which the demands of jobs within the same general pattern will be absorbed varies directly with the general ability level of the person. In this connection a distinction should be drawn between jobs that require the acquisition of one pattern of abilities or skills and jobs that require frequent change, discrimination, and judgment; those in the former class can frequently be mastered by candidates who indicate relatively low promise on a general test, while those in the latter class are rarely mastered by candidates with low scores on tests that are reliable and valid for the work situation. The particular tests that may indicate peculiar training promise will be indicated in the discussion on training.

Topics for Report

1. What theory of intelligence is assumed in the chapter—that sponsored by Spearman?
2. Classify the items in any one "omnibus" test in terms of the types that are used.
3. Compare the results from two tests—*e.g.*, one omnibus test and one group test—given to five members of the class.

Required Readings

1. SCOTT, W. D., R. C. CLOTHIER, S. B. MATHEWSON, and W. R. SPRIEGEL: *Personnel Management,* 3d ed., pp. 154–169, McGraw-Hill Book Company, Inc., New York, 1941.
2. PINTNER, R.: *Intelligence Testing, Methods and Results,* 2d ed., pp. 180–220, 471–493, Henry Holt and Company, Inc., New York, 1931.
3. MOORE, H., in *Experience with Employment Tests,* pp. 6–11, Studies in Personnel Policy, No. 32, National Industrial Conference Board, 1941.

Supplementary Readings

1. BINGHAM, W. V. D.: *Aptitudes and Aptitude Testing,* pp. 16–59, 330–344, Harper & Brothers, New York, 1936.
2. SPEARMAN, C.: *The Abilities of Man,* pp. 1–135, The Macmillan Company, New York, 1927.
3. MYERS, G. E.: *Principles and Techniques of Vocational Guidance,* pp. 166–189, McGraw-Hill Book Company, Inc., New York, 1941.

CHAPTER VI

SPECIAL ABILITY TESTS (MECHANICAL AND CLERICAL)

ASSUMPTIONS OF SPECIAL ABILITY TESTS

Tests of special ability have appeared in many forms and with three basic assumptions:

1. On the assumption that special abilities exist as distinct entities, tests have been constructed to appraise each entity; typical of such tests are the various spatial relations tests, the mechanical ability tests, the finger dexterity tests, and the visual acuity tests.

2. On the assumption that any so-called special ability is a combination of a number of elements, tests have been constructed to appraise each element or aspect; typical of such tests are the Seashore Musical Tests and the Zyve Scientific Aptitude Test.

3. On the assumption that specific types of work demand combinations of particular types of abilities, batteries of tests have been devised, or evolved from existing tests, and various so-called special ability tests have been tried out to discover the degree of correlation of each special test with the over-all demands of the job. This type of approach to an analysis of the special abilities demanded by jobs has found its most outstanding sponsorship in the Federal Research Bureaus.[1] It is this type of approach that has produced the mcst reliable and satisfactory results. It is necessarily preceded by job analyses and the conversion of the results from job studies into assumed necessary abilities. On the basis of that assumption a number of standardized or specially constructed tests are tried out, and from the correlations that ensue the most significant battery is selected to appraise future candidates.

While the need for special ability tests is widely recognized, the means of satisfying that need are limited; the most commonly accepted solution is the adoption of a standardized test that goes by the name of the ability that seems to be most important; the possibility of standardizing weighted batteries of tests for special patterns of ability is limited by two factors:

a. The difficulty of getting trained testers who also know the technique of job analysis and who can or will be trusted by management to conduct a series of experiments.

[1] STEAD, W. T., C. L. SHARTLE, and associates, *Occupational Counseling Techniques*, pp. 273, American Book Company, New York, 1940.

b. The expense that such an experiment involves. The expense that is incident to the time spent by the test administrator is insignificant in comparison with the time that must be spent by employees who are removed from their work place to spend 6 to 8 hours on a battery of tests; the net loss to a company is a minimum of 1,000 hours, and very rarely is it as low as that.

The net results of these limitations is that such a standardization process is limited to research agencies and to but few research-minded companies. In organizations where there is a consciousness of demand and a conviction of value the special ability tests are frequently limited to those that are already standardized and labeled; in those places where qualified psychologists have had an opportunity to use their spare time studying the tests and the employees, the resulting batteries of tests are peculiar to situational demands and cannot be transported even to obviously similar situations in other concerns.

The special ability tests that are in most frequent demand by business and industry are of two types: mechanical and clerical. Both types may be grouped into two classes: *unitary*, in which one aspect of the ability is assumed to represent the whole or is measured as an independent entity; and *multiple*, in which various aspects of the ability are combined into one pattern. Because of the increasing interest in promise of mechanical ability, the various tests will be described in some detail.

MECHANICAL ABILITY TESTS

There are two principal aspects of mechanical ability with which the employment manager is concerned:

a. The level of achievement of which the candidate is capable, *i.e.*, the trainability of candidates.

b. The extent to which the candidate is fitted to perform the requirements of elementary jobs.

For the first problem the solution that psychology has to offer is in the form of general tests that sample mechanical knowledge and ability to reason through simple or imaginary mechanical problems. For the second problem the solution is in the form of specially devised tests for those functions that are pivotal to the demands of the situation. It should be remembered that there is no test that pretends to measure the complete mechanical demands of any one job; human demands vary in quite similar jobs. Bingham says:[1]

Each kind of operation introduces its own variants and demands and its own additional skills. The packer of candies must choose in each instance which bonbon to reach for and where to put it in order to complete the standard pattern of the assortment she is packing. The packer of dates must estimate the size

[1] Bingham, W., V. D., *Aptitudes and Aptitude Testing*, p. 117, Harper & Brothers, New York, 1937.

and be alert to notice and reject defective fruits. Many manual manipulations call for the abilities of inspector and sorter as well as packer.

The mechanical ability, motor coordination, or manual dexterity demands are combined, in different jobs, with the need for fine visual discrimination, with the need for perceiving small differences, for making judgments of position and form, and for tactual discriminations. No single manual aptitude test can appraise these various abilities; the test that is chosen should give an approximate appraisal of the ability to meet the key demands of the job.

In the following descriptions, the tests are grouped in terms of the problems of the employment manager. Those that have promise of value in the solution of his first problem, the trainability of candidates, may be divided into two groups: paper-and-pencil and manipulative tests.

Paper-and-pencil Tests of Mechanical Promise.—The following tests are arranged in two groups. Group *A* includes those in which the primary concern is the estimation of the strength of one capacity or in which the contents are all similar. Group *B* consists of those that attempt to estimate numbers of capacities and whose contents vary from subtest to subtest.

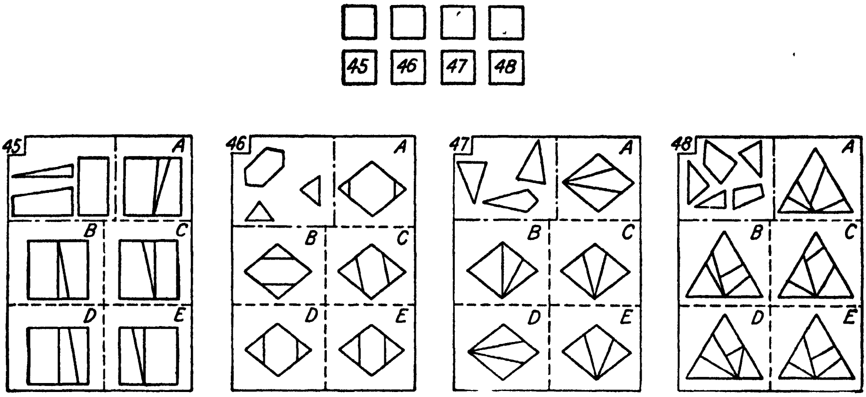
*A*1. *The Minnesota Paper Form Board Test.*—This has appeared in three forms, the original in two series, a revision by Likert and Quasha, and a revision of the revision by Schultz. The original form consists of 56 problems and requires candidates to divide up forms and shapes so that they will contain the subdivisions that are placed by their side; the first revision consists of 64 problems, each of which consists of five subdivided figures from which one must be chosen that contains forms that are the same as the separately shown sections.[1]

The Schultz Industrial Revision[2] puts the separate sections in black and asks candidates to cross out the one of the five alternate forms into which the parts will fit.

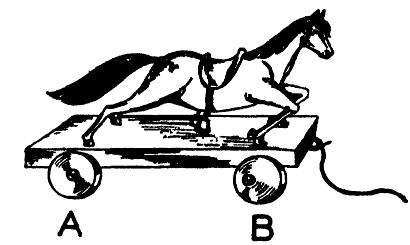
TABLE 37.—CORRELATION COEFFICIENTS BETWEEN THE MINNESOTA PAPER FORM BOARD AND VARIOUS TYPES OF PRODUCTION RECORDS

Types of records	Number of cases	Correlation
Power sewing-machine operators, I	46	.306
Power sewing-machine operators, II	23	.483
Can packers	43	.276
Merchandise packers	30	.485
Pull-socket assemblers	16	.053

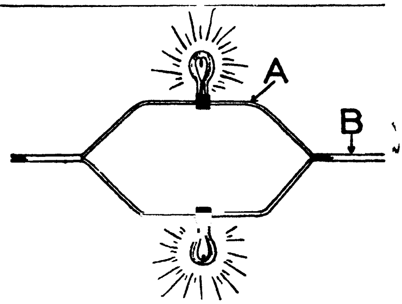
[1] Illustrations are given in Fig. 4, section *A*.
[2] SCHULTZ, R. S., *Jour. Applied Psychol.*, 24: 436-437, 1940.



Section *A*

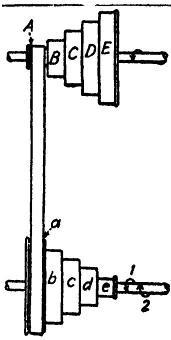


Which end of the toy horse will buck more when it is pulled along the floor?

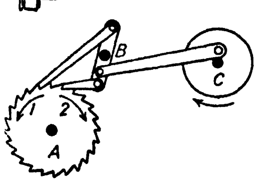


Which wire carries more current?

Section *B*



1. If the upper shaft is turning at constant speed, on which set of pulleys, *A-a*, *B-b*, *C-c*, *D-d*, *E-e*, must the belt be put to make the lower shaft run fastest?... *A-a* *B-b* *C-c* *D-d* *E-e*
2. If the upper shaft is turning in the direction shown, which way will the lower shaft turn?........................ 1 2



1. Does *A* turn in the same direction all of the time? Yes No
2. When *C* is turning in the direction shown, which way is *A* turning?........ .... 1 2

Section *C*

FIG. 4.—Samples; Section *A* is from the Likert revision of the Minnesota Paper Formboard; Section *B* is from Bennett's test; Section *C* is from Thurstone's.

The object of the test is to get some indication of the candidates' ability to make fine spatial distinctions; the possible value of the test depends on the extent to which the job places a demand for such ability on the operator. The original and the first revision have been subjected to considerable experimental work, and have shown positive correlations with production records on many types of mechanical tasks. The U. S. Employment Service reports the correlations[1] given in Table 37.

A2. The Bennett Test of Mechanical Comprehension, Form A A.—This test consists of 75 items, of which Fig. 4, section *B*, gives two examples, arranged in order of difficulty and designed to "measure the ability of an individual to understand various types of physical relationships." Its reliability coefficient is .84 and its correlation with other so-called mechanical tests ranges between .40 and .59. Norms are provided for students between the ninth grade and the first year in an engineering school, as well as for candidates for apprentice training, technical courses, and engineering jobs.

A3. The Thurstone Mechanical Movements Test.—This test contains 22 parts, of which Fig. 4, section *C*, furnishes two examples. It seems to give an estimate of the speed with which mechanical problems can be understood.

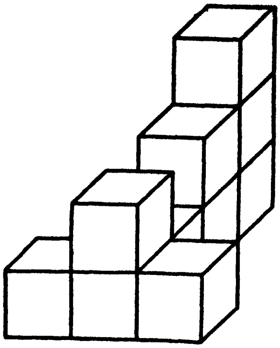
A4. The Yale University, Department of Personnel Study, Mechanical Ingenuity Tests.—These tests are somewhat similar to the Thurstone test, but they include more complex parts and a greater variety of mechanical devices. They represent a new type of test with which psychologists have been experimenting, and give some indication of value for selecting the creative and imaginative type of mechanical worker.

A5. The Yale University, Department of Personnel Study, Spatial Visualization Tests.—These tests consist of three parts, (*a*) a cube test, in which there are 20 piles of cubes painted on all sides except the bottom, with the problem of counting the number of sides of each cube that are painted; (*b*) an orthographic projection test in which there are 20 blocks, pictured from two "views," and with four choices each for the selection of the third "view"; (*c*) a composite figure test, in which the two, three, or four parts that will completely fill another form are to be selected, in each of 47 different patterns. Illustrations of each of these parts will be found in Fig. 5.

A6. The N.I.I.P. Squares Test.—This consists of 55 forms, which are to be divided by connecting two numbered points in such a way that the sections when rearranged will form a square. An illustration is given in section *A* of Fig. 6.

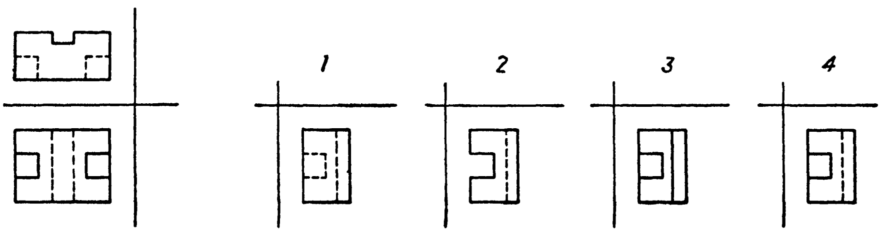
A7. The N.I.I.P. Figure Construction Test.—This consists of 12 figures whose corners are to be represented by from four to seven numbers

[1] STEAD and SHARTLE, *op. cit.*, Figs. 43 and 47, pp. 221, 223.

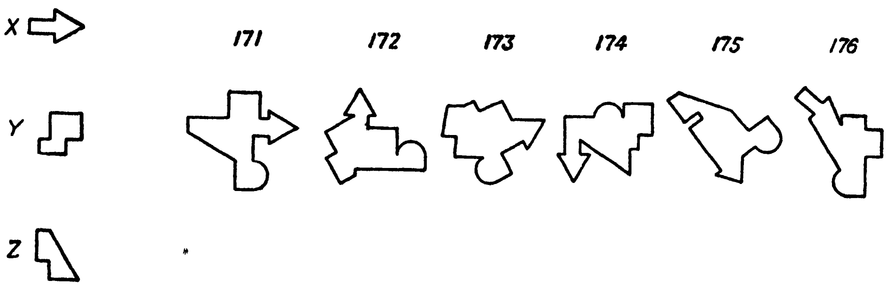


In Fig. *A* how many cubes have:
103. none of their sides painted?
104. just one of their sides painted?
105 just two of their sides painted?
106 just three of their sides painted?
107 just four of their sides painted?
108. just five of their sides painted?

A The cube test



B. The orthographic projection test. (Which is the third view?)



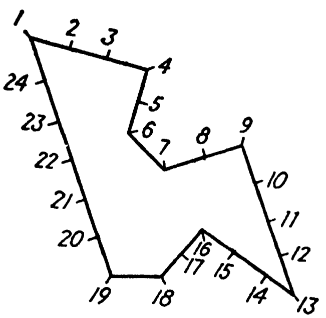
C The composite figure test. Every figure on this page is composed of Figs *X*, *Y*, and *Z*, on the left-hand side of the page, plus one of the Figs *J*, *K*, *L*, *M*, *O*, *P*, *R*, and *S*. The candidate is asked to select the figure which, added to Figs. *X*, *Y*, and *Z* will complete the larger figure.

FIG 5—Yale University, Department of Personnel Study—spatial visualisation tests.

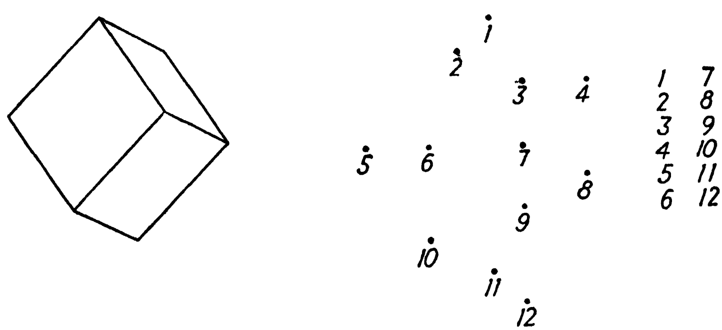
chosen from numbers 1 to 12 arranged in a pattern. An illustration of this test is found in section *B* of Fig. 6.

*A*8. *The Cox Mechanical Aptitude Tests.*—These tests are in three series, with four parts to each series. Series I contains five problems, illustrations of some of which are given in section *C* of Fig. 6.

a. Mechanical Models.—The examiner exhibits a board on which are strips fitted together in various forms and so arranged that the movement of one part—*e.g.* a



A.—N. I. I. P. squares test. Connect two numbered points to form a square.



B.—N. I. I. P. figure construction test. Check the numbers that represent the corners of the cube.

FIG. 6.

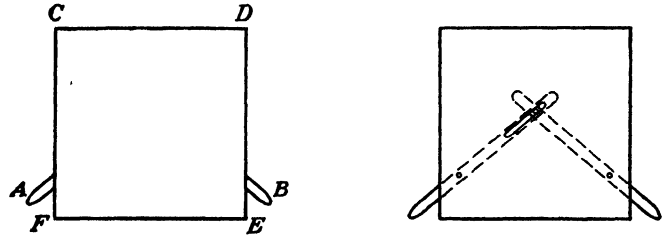
lever or a button—sets up similar or different movements in other parts. The mechanism conveying the motion from the manipulated fitting to the others is concealed behind the board. On a diagram the candidate indicates the parts necessary to produce the shown movements. This is the most widely used test in the Cox battery; significant correlations with academic achievement in trade school courses and with the shop progress of apprentices have been reported.

b. Mechanical Explanation.—This, together with an advanced form of the same in the *c* and *d* groups, resembles the Thurstone test.

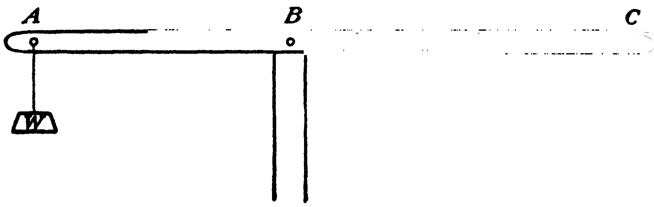
e. Knots.—This test contains 20 cards, each of which has a diagram of a twisted rope. The candidate is given the problem of computing the number of knots that would result if the rope were lifted by both ends and pulled in opposite directions.

A9. The Clair V. Mann Tests of Power to Visualize.—Three tests are offered, the dynamicube, the staticube, and the mutilated cubes.[1]

B1. The MacQuarrie Test of Mechanical Ability.—This is a test consisting of seven subtests, which may be divided into two groups: manual



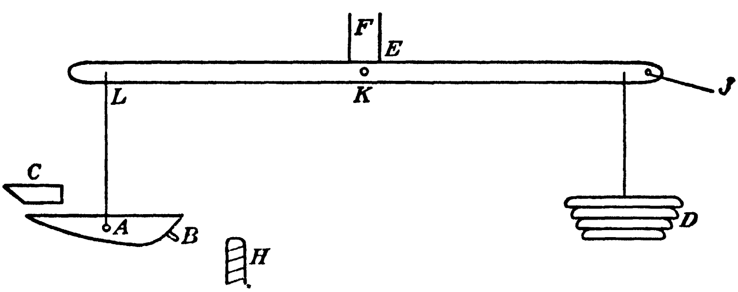
a. Mechanical models. (*After Cox.*)



b. Mechanical explanation and completion. (*After Cox.*)

A-C is a rod balancing on a pivot at *B*. *W* is a weight hanging from *A*. *AB* measures 1 foot; *BC* measures 2 feet.

1. If *C* is pushed downward through a circular distance of 1 foot, say exactly what will happen at *A*?
2. Will *W* change its distance from the ground by more or less than, or the same as, *A*'s distance changed?



c. Mechanical diagrams. (*After Cox.*)

1. Explain what would happen if tap *C* were turned on and left.
2. What is *H* for?

C.—Cox mechanical aptitude tests.

FIG. 6 (*Continued*).

and perceptual. The manual group includes tracing, tapping, and dotting problems; the perceptual group, the copying of patterns, the location of letters in squares by reference to their corresponding positions in

[1] For complete descriptions of these tests, see PATERSON, D. G., *et al.*, *Student Guidance Techniques*, pp. 250–254, McGraw-Hill Book Company, Inc., New York, 1938.

larger squares, the counting of the number of blocks in the group, and the tracing of lines through mazelike patterns. The reliabilities of the subtests range from .48 to .81 when teachers' ratings are used as criteria; the validities are indicated by the correlation coefficients in Table 38.

TABLE 38.—VALIDITY COEFFICIENTS OF THE MACQUARRIE TEST

Criterion	Correlation	Criterion	Correlation
Years of schooling	.291	Otis higher examination	.381
Scovill Test *F*	.507	Stenquist assembly	.66
Card-punch machine operators	.133	Pull-socket assemblers	.138
Lamp-shade sewers	.009	Merchandise packers	.124
Can packers	.089	Calculating machine operators	.432

The low correlations that are given in Table 38 are due in part to the summation of scores from different aspects of mechanical ability into one total score; isolated sections of this test have been found to show significant correlations with production records in some mechanical jobs. For that reason, the chief value of the test to the employment manager lies in the promise of ability indicated by different subtests rather than in the assumed level of promise that the total score may indicate.

B2. The N.I.I.P. Form Relations Group Test.—This consists of seven tests including patterns represented in bi- and tridimensional space; for each incomplete pattern there are from 10 to 15 parts, from which one or more should be selected to complete the pattern. Supplementing these tests is a memory-for-design test, in which eight designs shown in succession are to be drawn from memory. Significant correlations have been found[1] between this test and the N.I.I.P. Group Test of Intelligence, the N.I.I.P. modification of the Stenquist assembly test, and instructors' estimates of proficiency in the trades of fitter, smith, carpenter, and electrician.

B3. The Detroit Mechanical Aptitudes Examination, Form A.—This consists of five tests of special ability and three tests of general ability. The special ability tests are in two groups: (*a*) motor, consisting of two tests, one of which requires testees to insert x's in circles and the other to substitute numbers for letters; (*b*) visual imagery, consisting of three tests—one containing seven groups of similar forms, the parts of which are to be arranged in order of size, and the second containing nine groups of pictures broken into three to nine parts, which are to be arranged in normal order, while the third contains 24 patterns of two wheels and a belt each, from which testees are to estimate the relative rate and direc-

[1] SLATER, PATRICK, Some Group Tests of Spatial Judgment or Practical Ability, *Occupational Psychology*, 14: 40–50, 1940.

tion of the second wheel. The reliabilities of the subtests range between .57 and .87, and norms for eighth-grade students are offered. The validity of the whole or of the subtests is unknown.

B4. Stenquist Mechanical Aptitude Tests, I and II.—Each form consists of 19 groups of pictures of mechanical parts or tools, each composed of two sections of five parts; one section contains the picture of one part of a machine tool and the other section contains the other part. The candidate is asked to match the parts in each pair. Test II supplements the pictures with questions relating to tools and their uses. The reliability quotients range between .67 and .84 and the validity quotients, checked against school progress and shop records, range between .66 and .84.

B5. The O'Rourke Mechanical Aptitude Test, Junior Grade, Forms A, B, and C.—These forms are of the picture-matching type and include 60 multiple-choice mechanical information questions. Percentile norms, based on the scores of 70,000 workers who applied for mechanical jobs of 33 types, at the apprentice and journeyman levels, are offered. The validity quotients range between .64 and .84, when teachers' ratings are used as criteria.

Each of the tests outlined in groups *A* and *B*, above, rests for its validity on one of two assumptions: (*a*) The assumption that level of knowledge is an index of level of ability. This assumption is frequently invalidated because of limitations of environment. In environments that place major emphasis on literary and cultural achievements the low level of mechanical knowledge frequently shown by applicants indicates lack of opportunity rather than lack of ability; and in such environments as provide opportunity for gaining mechanical knowledge to the exclusion of nearly all others, the level attained in a mechanical information test is an indication of general ability level rather than of mechanical ability level. Such interpretation as the results from tests of this kind permit is colored by the opportunities and encouragement provided by the past. (*b*) The assumption that the ability measured in symbolic form by the test will express itself in manipulative form at the approximate levels that are indicated by the results from the test.

The relatively low correlations between some of these tests and production records, as well as the discrepancy that many instructors of apprentices have found between "book knowledge" and "ability to do" lend support to the frequently expressed belief that results from such tests should receive corroboration from other sources before they are used as bases for selection.

Manipulative Tests of Mechanical Promise.—These tests have appeared in many forms and with as many objectives. Their purpose is to provide candidates with an opportunity to display the skill with which

they can assemble familiar and unfamiliar tasks, solve puzzles, and duplicate patterns, and the speed and accuracy with which they can perform tasks that require fine or coarse muscular adjustment. At the same time they provide the tester with an opportunity to observe the carefulness, planfulness, and system with which problems are attempted, and the ease with which candidates master problems of varying degrees of complexity.

Some of the many tests that are available can be grouped in terms of the capacities or abilities that they attempt to estimate. The accuracy with which the different tests measure the strength of the capacities may be indicated by the available coefficients of correlation; however, it should be remembered that correlational coefficients with work records are not evidence for or against the values of the tools as measures of the strength of a function. Most tasks require the interplay of many functions; no test isolates any one function and appraises its level; the most that can be said for any test is that in its performance there is a heavier demand on the exercising of one function or pattern of abilities than there is on others.

A. *Tests that require applicants to assemble disassembled parts, thus providing an opportunity to appraise motor speed and ingenuity.* These tests are usually called mechanical assembly or mechanical ingenuity tests; they consist of a number of articles, such as a bicycle bell, a rim lock, a spark plug, and a clothespin, which are disassembled and which the candidate is to reassemble within a definite time limit. Of such tests the following are in use:

a. The Stenquist Mechanical Assembly Test.

b. The Minnesota Mechanical Assembly Test, in two sets or forms, one consisting of 36 items and the other of 20.

c. The Detroit Mechanical Assembly Test.

d. The Toops I.E.R. Assembly Test for Girls, a modified and shorter form of which is standardized by Burr and Metcalf.

B. *Tests that require applicants to place objects in assigned positions, thus providing opportunity for appraising eye-hand coordination and speed and accuracy of movement.* This type of test appears in various forms and with various types of tasks: placing dots in circles with a lead pencil, tapping with a stylus, tapping with a telegraph key, and inserting a stylus in metal-surrounded holes. The following are the most commonly used and valuable tests:

1. *The O'Connor Finger Dexterity Test.*—This is a modification of a pegboard test devised by W. F. Kemble,[1] and consists of 300 standard 1-inch metal pegs and a metal plate containing 100 holes, each of which

[1] KEMBLE, W. F., *Choosing Employees by Mental and Physical Tests*, p. 13, McGraw-Hill Book Company, Inc., New York, 1917.

is large enough to hold three pegs. The subject is asked to pick up the pegs, three at a time, and place them in the holes until all are filled. The score is the time taken to complete the task. The test has been found of value in selecting workers for fine assembly work, and is widely used. In one study[1] in a watch factory the superior workers, as judged by weighted production records, averaged approximately 1 minute less than the mediocre workers in completing the test; this led to the conclusion that "speed on the dexterity tests does tend to select the successful workers in the plant . . . finger dexterity seems to be highly desirable for superior work in the plant." On the other hand, for some types of assembly work the test seems to have but little value. In a study made by the Technical Board of the U. S. Employment Service[2] the validity coefficients for 16 pull-socket assemblers was −.090, and for 18 put-in-coil girls was −.284.

2. *The O'Connor Tweezer Dexterity Test.*—This differs from the finger dexterity test in that it requires the insertion of only one pin in each hole, and that tweezers or pincers are used for the operation. O'Connor suggests[3] that a high score—*i.e.*, completing the task in less than 5½ minutes—indicates ability to do such tasks as watch repairing, detailed jobs in the manufacturing process, and instrument-armature and miniature-instrument assembling. In the experiment in the watch factory, the scores made by plant workers were significantly different from those made by a cross sample of the general population, but the differences between the scores made by the mediocre and superior workers were not so large as the differences between the same groups on the finger dexterity test. Other studies have shown zero or negative correlations; for example, the Technical Board of the U. S. Employment Service gave the test to 18 put-in-coil girls, and secured a coefficient of −.567 with work records.

Various modifications of this board have been suggested: the same number of holes in either side of a board with the task of transferring the pins from one side to the other, placing the holes at a 45-degree angle, holding the board vertically instead of horizontally, and increasing the number of holes. The value of the test can be known only when its results are checked against piece-rate production workers of the same type as those for which selection is to be made.

3. *The Minnesota Spatial Relations Test.*—This test is an extension of a similar test devised by H. C. Link for selecting factory assemblers. It consists of four form boards, each with 58 different-sized cutouts,

[1] CANDEE, BEATRICE, and MILTON BLUM, Report of a Study Done in a Watch Factory, *Jour. Applied Psychol.*, 21 (No. 5): 572–582, 1937.

[2] SHARTLE and STEAD, *op. cit.* Fig. 65, p. 235.

[3] O'CONNOR, J., *Born That Way*, p. 174, The Williams & Wilkins Company, Baltimore, 1928.

conveniently arranged in two sets so that the proper position of board *A* is the problem position of board *B*, and the proper position of board *C* is the problem position of board *D*. The score is the time taken to complete all four boards, with the option of using board *A* as a trial test and computing scores on the times needed to complete boards *B*, *C*, and *D*. The variations for the four boards among different types of mechanical workers may be seen from the mean score in Table 39.

TABLE 39.—TIME SCORES ON MINNESOTA SPATIAL RELATIONS TEST

Number of cases	Occupation	Time, seconds	Percentile
102	Garage mechanics	1,014	86th
36	Iron metalworkers	1,059	80th
170	Manual training instructors	1,098	75th
20	Draftsmen	1,200	59th
31	Machine operators	1,475	26th

The validity coefficients range between .20 and .55 when can packers, card-punch machine operators, and power-sewing machine operators are used as subjects.

4. *The Minnesota Rate of Manipulation Test.*—This consists of a board measuring 39½ by 10¼ by 9⁄10 inches, in which there are four rows of 58 holes, each 1¾ inches in diameter, into which blocks 1 11⁄16 inches in depth are to be placed four times. In another form, called the turning test, the candidate is required to turn each block over before inserting it in the hole. This test has been found of value in selecting such operators as butter packers and wrappers and cartoners.

5. *The Nuts-and-bolts Test.*—This appears in a number of forms, one requiring subjects to screw 10 similar nuts on 10 similar bolts, another requiring selection of nuts and bolts of different sizes and screwing a number together, and another requiring the combinations to be placed in holes of approximate sizes. Positive correlations are reported with several types of assembly workers.[1]

C. Tests that require judgment of size, form, and position, and thus provide opportunity to appraise candidates' sense of proportion and their ability to project imaginary into actual situations. Tests that may be grouped in this category are mostly of the form-board type. Among the many that are available, the four that follow have been used in the industrial employment office with some success.

1. *The Army Block Test.*—This consists of three sets, one containing a model of nine blocks glued together and painted around the sides, another with a model of eight blocks glued together in two-story fashion

[1] MORTON, M. W., *Individual Diagnosis*, McGill University, 1937.

and without any painted sides, and a third with nine blocks glued together and with painted sides and top. The candidate is provided with nine blocks with varying numbers of painted sides, and is asked to copy the first pattern and then construct the remaining two according to directions.

2. *The Dearborn Formboard* 3.—This differs from most form boards in that some of the parts are interchanged and the candidate is given the task of replacing the misplaced parts and inserting the omitted ones, with the least number of moves.

3. *The Kent-Shakow Industrial Formboard Test.*—Each board, in this test, contains a number of circular or rectangular cutouts, which are to be filled with from three to five pieces selected from a collection of similar pieces, which differ from the "true" pieces in small amounts or degrees.

4. *The O'Connor Wiggly Block.*—This test consists of a block of wood cut into nine irregular pieces, which are to be arranged to form a cube. O'Connor says that engineers, design draftsmen, and tool- and diemakers solve the problem in a relatively short time, and that the test "measures an innate aptitude for visualizing the essential relations of structure." The reliability of this test varies between .307 and .367, and the validity ranges between −.30 and .62 when grades in trade school courses are used as criteria.[1] The opportunity for observation of the method of attack that the solving of the problem offers to the examiner is one of its principal values.

D. Tests that appraise the strength or acuity of one function. In this group are being placed those single tests that have been found of value in appraising the strength or weakness of one function or capacity that is relatively easily isolated.

1. *Strength Tests.*—The Smedley hand dynamometer and the strength-of-back tests have been accepted parts of the employment procedure in some companies where physical strength is a job necessity.

2. *Auditory Tests.*—The Seashore audiometer is of value as a selection tool for such workers as telephone operators, and may be of value for ediphone and dictaphone operators. It consists of an induction coil, a battery, a galvanometer, a resistance coil, switches, and a telephone receiver. A scale reading from 1 to 40 has corresponding sound intensity values between 1 and 1079, graduated from the middle to either end of the scale in terms of increasingly fine sound discriminations.

3. *Visual Tests.*—Three types of visual tests are available:

a. Paper-and-pencil tests.—These are designed to test the accuracy with which candidates can read fine print and print at varying distances; of the standard forms available the one that appears as a subtest of the

[1] See articles by H. H. Remmers, *Personnel Jour.*, 12: 155–159, 1933–1934, and *Jour. Applied Psychol.*, 20: 591–598, 1936.

California Test of Mental Maturity is easy to administer. That consists of a number of horizontal rows of letters of large type, above each of which there are five letters from each row in increasingly smaller types. The last row that can be read easily indicates the level of acuity.

b. Color-blindness tests.—Of the many forms that are available the Ishihara Color Perception Test is the most widely used. It consists of 16 plates of white cardboard, 4¾ inches square, upon which are printed colored circles with diameters of 3½ inches each. The circles are formed of many colored dots arranged in such a way that certain designs will reveal one number to a normal vision person and another to a person with total or partial color blindness. The reliability of the test is .90, and the validity, as checked against the percentage of the male population commonly accepted as being partially or entirely color blind, 8 per cent, is high.

c. Machine tests.—Of these the most commonly used form is the Keystone Telebinocular. This is constructed in a similar manner to the stereopticon, making use of 10 slides to test candidates for color discrimination, visual acuity, vertical imbalance, depth perception, ametropia at both the near and the far point, near-point fusion, and lateral imbalance. The complete set can be administered in less than 5 minutes. Supplementary slides are provided for training purposes.

The tests that are outlined in groups *A*, *B*, *C*, and *D*, above, have varying selective values in different organizations. In order for any test to have selective value it must be reliable and valid. Its reliability is usually known by the retest method; its validity can be known only when its results are checked against the production records of workers at similar types of work in the company in which the test is being used.

TRADE TESTS

The second problem with which the employment manager is concerned is the trainability of candidates or employees. The extent to which tests may be of value in the solution of this problem will be discussed in the chapter Training the Employee. His third problem is to estimate the extent to which the candidate can do well the tasks that he professes to be able to do. For the solution of that problem there are various standardized and unstandardized tools. The most commonly used tool is a tryout, either in the employment office or in the apprenticeship training division or on the job; sometimes the tryout is in the form of a cross-examination that elicits knowledge about the tools that may be used and the manufacturing processes. When that cross-examination is put in systematic and standardized form, it is called a trade test.

Whether in a standardized form or in a hit-and-miss fashion, trade tests are being, and have been, used in the selection of factory operatives

from time immemorial. Since the Committee on Personnel in the Army discovered the general unreliability of applicants' claims to trade knowledge, there have been attempts to standardize and objectify trade tests, so that the examiner will be limited in the types of question asked, and the answers will be made specific and definite, so that inexactness can be readily detected. The Trade Test Division of the Committee on Classification of Personnel in the Army formulated a set of rules for constructing trade questions, and these have been extended and improved upon, particularly by the Cincinnati Employment Center,[1] where the following principles are used in constructing trade questions:

a. Each question within each trade must be applicable to the trade

b. The question must represent a principle of action that is based upon sound trade practice and custom.

c. It must be suitable for use in any geographical location.

d. It must differentiate between the various levels of trade ability in such a way that no novices can obtain high scores, apprentices within the occupation must have lower scores than journeymen, and so far as possible experts should be able to answer the questions in a manner distinctly superior to the journeymen.

e. The questions must not yield a variety of correct answers.

f. Questions must not contain colloquial terms or require colloquial terms as answers.

g. Questions must be simple to answer, free from ambiguity, and have no "catches."

In the Army three kinds of trade tests were used—oral, picture, and performance. The last group, performance trade tests, are expensive to administer and of doubtful value, unless there has been considerable research work with each of the trade groups. The picture trade tests were adopted in the Army as a supplement to the oral trade test. They have not been so widely used as the oral, despite the following advantages that they have:[2]

a. They approximate trade situations more closely than does the oral test.

b. The tradesmen have more confidence in them, because they seem to be practical.

c. More intricate questions can be asked.

d. The picture imaginatively transports the tradesman to the actual situation and helps him recall methods better than he could if there were no guide.

In spite of these advantages, the picture test has not been widely used, chiefly because

a. It is difficult and expensive to construct, photographs and drawings not being easily procured.

b. It is awkward to give and takes more time than the oral test.

[1] THOMPSON, LORIN, A., *Interview Aids and Trade Questions for Employment Offices*, p. 11, Harper & Brothers, New York, 1937.

[2] See CHAPMAN, J. C., *Trade Tests*, pp. 195–197, Henry Holt and Company, Inc., New York, 1921.

c. Often, the tool or machine pictured varies in some detail from that known by the tradesman; it may be too simple or too complex, out of date or too modern—all of which distracts attention when taking the test.

d. Many people are not visual-minded and cannot read diagrams or illustrations, or they are so interested in slight variations in the pictures that they ignore the questions, or they are confused when there are several questions concerning the same picture.

These objections have been so serious that, with a few rare exceptions, the picture form of trade test has disappeared; and despite the fact that the oral test seems theoretical and does not establish rapport between the tradesman and the examiner, it has gradually supplanted the others and is now being quite widely used. In the use of it the form that the question takes and the type of answer that the question makes possible are all-important. A general question leads to so many types of reply that evaluation of them is impossible; for example, if the question, "Suppose a car was left in a garage for repair, and you were not told what was wrong, how would you proceed?" were asked, the answer would conform to a number of standards of procedure, and evaluation would be correspondingly difficult. When, on the other hand, the question that is asked permits a definite reply or a choice of three or four replies, evaluation is simplified. It is this latter type of question that has been standardized. It may appear in two forms—(*a*) single answer, (*b*) multiple answer. Of these two, the multiple-answer question is used less frequently, because

a. It is difficult to standardize the answers so that all examiners will give them the same rating.

b. The examiner usually must have considerable trade knowledge in order to give proper weight to unusual supplementary replies.

These objections have limited the trade question to the specific single-answer type, and it is in that form that most trade questions appear today. Devising a set of trade questions, however, has many more problems besides the form that the questions should take. The major concern, of course, is the nature of the information that is sought. The Cincinnati Employment Center suggests a definite form of procedure to be followed[1] in gathering from tradesmen the pertinent facts about the work experience. The suggested outline for them is as follows:

1. At what skilled trades have you worked?
   How long have you worked at each one?
   What did you do?
   What was the final product?
   What was your rate of pay?
   Was the work interesting to you?

[1] THOMPSON, *op. cit.*, pp. 15–16, 1937. Quoted by permission of the publishers, Harper & Brothers, New York.

2. What tools do you own?
   What instruments, implements, appliances, machines?
   Do you have a uniform or proper work clothes?
3. What kinds of machines have you operated? Give the name of the manufacturer of the machine, the size, the purpose for which the machine was designed, the products that can be made, what you did with the machine, what the final product was, how many months' experience you had with it, whether or not you consider yourself an expert with it.
4. What degree of accuracy was required on each kind of machine on which you have worked? In each operation, if no machine was involved?
   Do you read blueprints? scales? micrometers? verniers?
5. What safety measures do you use in your work to protect yourself from injury? Are any safety devices required?
   If so, how are they tested or inspected? When? By what means? By whom?
6. Where did you learn your trade? How?
   Did you serve an apprenticeship?
   Did you study at trade school?
   Did you complete your training course?
7. Do you have a trade license? Is it active? If so, when does it expire? Have you ever held a license? If so, why did you let it lapse? Could you get a license today? How?
8. Do you belong to a trade union? Is your membership active?
   Did you take an examination to get in?
   Have you ever belonged to a union? If so, why did you quit?
   Could you get into the union today if you desired?

From such systematic questioning of those who are proficient in a trade can be gathered the information that is later to be put into question form and then administered to a number of those who are familiar with the demands of the trade, in varying degrees, in order that standards and norms for the different levels may be obtained. An illustration of the form the test takes and the resulting norms are given in the following test for compositors and typesetters, used by the Cincinnati Employment Center.

1. Q. What does the proofreader's "w.f." indicate?
   A. Wrong font.
2. Q. What do you call a table on which the form is locked up?
   A. Stone.
3. Q. In what do you assemble the type from the cases?
   A. Stick.
4. Q. How are types made so that they can be placed in the stick in the proper way?
   A. Nicked.
5. Q. What do you use to get the type perfectly level in the form?
   A. Planer (mallet).
6. Q. What is the page number called?
   A. Folio.
7. Q. What space is generally used between words?
   A. 3-em.
8. Q. What machine is used to make the rule corners join perfectly?
   A. Mitering.

9. Q. What word do you use in proofreading to show that a portion of type matter marked "out" should be let stand?
   A. Stet.
10. Q. What do you call the large-size letter that is used at the beginning of a job?
    A. Initial.
11. Q. What size type would you use on a 5 by 8 circular of 200 words?
    A. 10-point or 12-point.
12. Q. What is the standard newspaper measure?
    A. 13 ems or 12½ ems.
13. Q. What size em is used as a unit for measurements?
    A. Pica (12-point) (12).
14. Q. What kind of spaces and quads are beveled on the back and front to clear the overhang of the letters?
    A. Script.
15. Q. What kinds of quads and spaces are used in electrotype?
    A. High.
16. Q. What folio would be placed beside page 2 in locking up a straight 16-page form?
    A. 15.
17. Q. By what name are block letters known?
    A. Gothic.
18. Q. What is the square of any body of type called?
    A. Em.
19. Q. What do you call the half tone where the background fades away gradually?
    A. Vignette.
20. Q. How many 8-point ems in a square inch?
    A. 81.

Each answer is worth four points, and the rating a person receives determines his promise. The standards for classification on this test are given in Table 40.

TABLE 40.—CLASSIFICATION OF RATINGS ON COMPOSITOR-TYPESETTER TEST

Score range	Rating	Meaning
0–14	1	A novice or beginner, no skill
5–12	2	A good novice or handyman
13–14	3	A new or poor apprentice
15–42	4	An average apprentice
43–44	5	An excellent apprentice or a very poor journeyman
45–56	6	A poor journeyman
57–65	7	Average journeyman
66–68	8	A thoroughly competent journeyman
69–75	9	An expert
76–80	10	A thoroughly competent expert or master workman.

Supplementing the work on trade tests that has been done by individual instructors and the Cincinnati Bureau is the work in progress under the auspices of the United States Employment Service, where tests in present use are being standardized by the adoption of wider

samples and larger collections of related questions than are used in private schools, and where tests for various types of new jobs, particularly in the machine industry, are being constructed.

In order that these tests may be of most value to the employment manager, the following cautions should be observed.

1. The tests should be tried out on groups of workers who are at the novice, the apprenticeship, the journeyman, and the expert stages in whatever types of work they are to be used as selection tools. Only when a test shows reliable differences between three or more of these groups should confidence be placed in its disclosures.

2. The tests are necessarily of a general nature; they have been standardized on a wide sample of the population. The conditions in the same trade in any one plant may not be an exact duplicate of those used in the sample; terminology may differ, machine parts may have been changed, and even the names given to the operators may be different from the standards accepted when the test was constructed. Because of these factors the contents of each test should be examined in terms of their comprehensiveness, their appropriateness, and the ease with which the questions can be understood by the workers at the journeyman level. The questions that do not apply should be eliminated and the unfamiliar terminology changed.

3. When changes are to be made, extreme caution should be observed. If five of the questions are to be replaced by five that seem to have a closer relation to situational demands, the person responsible for making the changes should select at least 10 questions, administer them to the workers at the different levels, and accept only those that show a significant difference between the expert, journeyman, and apprentice levels. Even when the questions are selected, the norms may need to be changed, for the questions are likely to ask for information that is peculiar to one company or to a small group; the chances that applicants will be familiar with particular knowledge are less than they are in the case of knowledge of a more general type.

4. The trade test does not appraise trade skill. Knowledge of how a job is to be done, what tools should be used, how parts should be fitted together, and what types of uses may be made of machines is no guarantee that candidates can do the job satisfactorily. Knowledge may be power, but it is certainly not skill; the failure to recognize this factor is a frequent cause of the abandonment of the use of a valuable elimination tool. It should be recognized that trade tests are primarily in the interests of experienced applicants; they serve as an elimination tool for experienced employees in the same way that intelligence tests do for beginners; they should be supplemented by skill tests if their results are to be used as a basis for recommendations of candidates to supervisors

and foremen. It should be remembered also that a high score on a trade test is no guarantee of successful work; the trade test gives no indication of the candidate's will to work, of his cooperativeness, of his stick-to-itiveness, or of his ambition. These factors are quite as important in job progress as are initial knowledge and skill.

CLERICAL ABILITY TESTS

Clerical tests have vindicated their use in business and industry more frequently and with more convincingly valuable results than have trade or mechanical tests; wide use of them has been aided by the fact that office managers became aware of the possible value of tests at an earlier date than did factory superintendents, as well as by the fact that they can be administered to groups, are sometimes constructed as power tests and consequently need no supervision while being taken, and are obviously related to job demands. But their successful operation over a period of years has been due to other factors:

a. The high degree of similarity of job requirements in the office departments of widely varying organizations, in contrast with the dissimilarity in types of factory operations.

b. The cooperation between such organizations as the National Association of Office Managers, the Life Office Management Association, selected insurance companies, and such research institutions as The Personnel Federation, The Psychological Corporation, and various graduate schools of education, which has made possible comprehensive surveys and job analyses on the bases of which tests representing different interests may be constructed. It is recognized that tests, by themselves, will not be adequate criteria for selection, but when combined with methods of personality analysis, an objective evaluation, as reliable as science has to offer, is at the disposal of the employment manager.

Clerical tests are based on one of two assumptions:

a. That there is such a quality or function as clerical ability, and that tests can be devised that will appraise the strength of that quality.

b. That clerical ability is a combination of a number of capacities, and that tests, to be of value, must appraise the capacities that are needed in the particular type of clerical work.

The first of these assumptions is the basis of one-unit tests, and has largely been abandoned in favor of the assumption that clerical ability is a compound that can be appraised only when the elements that comprise the compound are understood. The elements that are in that compound may be appreciated if an examination is made of the contents of Table 41. This table includes, in column (I), the types of items that are commonly found in clerical tests; column (II) includes some of the capacities that the separate tests attempt to appraise; and column (III) gives some indication of the importance of these capacities in office work.

TABLE 41.—CONTENTS OF CLERICAL TEST

I Type of test	II Capacity measured	III Significance in office work
1. Arithmetical reasoning	Ability to solve elementary reasoning problems in statistics	Promise of adequacy for statistical work
2. Business information	Interest in and acquaintance with the world of business relations	Degree of interest is indicated by extent of knowledge
3. Simple calculations	Familiarity with arithmetical compounds	Well-established arithmetical bonds are a promise of accurate statistical work
4. Checking and comparison	Ability to notice details	Lack of capacity to detect errors and omissions spells defeat
5. Classification	Judgment and organization	System and logical order are important in many positions
6. Copywriting	Handwriting	Legibility and consistency are essential
7. Following directions	Attention and memory	Understanding and remembering rules are necessary in many positions
8. Filing numbers and names	Ability to classify and systematize	Speed with which systems are learned
9. Grammar	Command of English	Correct transcription
10. Motor speed	Muscular flexibility	Machine operation
11. Numerical judgment	Ability to estimate	Promise for statistical work
12. Oral instructions	Oral memory	Attention and memory
13. Problem solving	Practical ability	Judgment in everyday situations
14. Spelling	Command of English	Correct transcription
15. Substitution	Learning new habits	Speed and accuracy in mastering new tasks
16. Verbal tasks	Breadth of verbal interest	Level of verbal ability as index of promotability
17. Verifying	Accuracy of established habits	Degree of self-confidence
18. Vocabulary	Verbal facility	Level of command of English

The extent to which existing tests make use of these types of material and appraise these capacities can be gained from an examination of Table 42. The first column contains the name of the test, the second contains the items in Table 41 that form part of the test, the third gives some data to indicate the test's validity.

The tests in Table 42 provide indications of promise rather than guarantees of achievement; they indicate the accuracy with which directions are likely to be followed, the care with which detailed work will

be done, the ease and accuracy with which computations will be made, and the systematic approach that will be used in handling confused data. They do not indicate the reliability, the thoroughness, the powers of application, or the capacity for work of candidates; estimates of those personality qualities that are pivotal to situational demands must supplement estimates of ability promise if confidence is to be placed in the results from objective tests. Neither do these tests estimate levels of achievement in those aspects of educational work that are of importance to the beginner, or the levels of skill that the commercially trained applicant may possess. Such estimates are made by means of achievement tests, of which those in Table 43 are samples.

TABLE 42.—AVAILABLE CLERICAL TESTS

Name of test	Contents	Comments
Benge, Clerical Test *D*	3, 4, 5, 16	Reliability by odd-even method is .87. Items are in right-wrong form
Bennett: Stenographic Aptitude	14, 15	Devised to predict capacity for learning shorthand and typewriting
Chicago Test of Clerical Promise	1, 3, 4, 6, 12, 14, 18	Reliability ranges between .85 and .96; intercorrelations between .11 and .48; correlations of subtest with total between .45 and .61
Detroit Clerical Aptitudes Examination	2, 3, 4, 6, 8, 10, 13, 15	Reliability .85; subtest intercorrelation range .19–.38. Aptitude age scores from eight to twenty years
Minnesota Vocational Test	4	Reliability by split-half method .85–.89; median scores and reliability coefficients for many types of workers provided
N.I.I.P. Clerical	3, 4, 5, 6, 8, 11, 12	Retest reliability .87; norms at the high school and college graduate levels
O'Rourke: Clerical Aptitude	1, 2, 3, 7, 13, 14, 16	Significant correlations with mental ability tests
Scott Company File Clerk	4, 8	Correlates .68 with a mental alertness test and .82 with supervisors' ratings
Shellow: Intelligence Test for Stenographers and Typists	2, 5, 9, 13, 14	Rank order correlation with rankings of 24 stenographers is .73. A power test
Thurstone: Examination in Clerical Work, Form *A*	1, 4, 7, 8, 13, 14, 15, 16	A self-administered power test with weighted values in terms of time and errors. Norms for different levels of office clerks

The advantage in using a standardized test is the opportunity given to compare candidates with established norms from a wide population sample; the alternative to the use of a standardized test is the use of a homemade test. That usually has the advantage of including terms and

phraseology that are peculiar to the organization, but frequently gives discrepant results because of the lack of uniformity in administration, the lack of adequate norms, the absence of reliable criteria in establishing norms, and the impossibility of comparing local with general standards.

TABLE 43.—REPRESENTATIVE OFFICE ACHIEVEMENT TESTS

Name of Test	Comments
Benge: Stenogauge	Has four parts: dictating a letter at the maximum rate it can be taken and correcting for time and errors, computing transcription rate and accuracy, and spelling errors. Validity coefficient of .89 with production records of 15 stenographers
Blackstone Stenographic Test, Form *A*	Contains one part on dictation, four on the mechanics of English, and two on business practice. Graded in difficulty
Blackstone Typing Tests, five forms	From copied material scores are computed on the basis of number of strokes corrected for errors in stroking and punctuation
Clem: Senior Typewriting	Five subtests: a standard stroking test, a business letter corrected for punctuation and paragraphing, a technical information test, a tabulation test, and a typing test. Norms on 2,200 students
Michigan Vocabulary	Classified into 8 different fields: human relations, commerce, government, physical sciences, biological sciences, mathematics, fine arts and sports; and standardized to give achievement levels in different subjects
The N.O.M.A. Tests	Seven tests: one on personality rating, one each on bookkeeping, stenography, typing, machine transcription, key-drive calculating-machine operation, and filing. The most widely used tests. Annual forms
O'Connor Vocabulary	Standardized at the high school level; includes words frequently occurring in business
Otis Arithmetic	Standardized at different educational levels; includes the four elementary compounds
Thurstone Examination in Typing	Three parts: typing from corrected copy, typing tabulated matter, and spelling. A power test corrected for time and errors. Correlates .71 with promotability
U. S. Army Trade Tests for Typists	Requires copying 300 words describing army organization. Levels of typing promise graduated in terms of expert, journeyman, apprentice, and novice

If tests are to be of significance to the employment officer they must be related to the demands of the job; these demands vary from situation to situation. The pivotal and most common demands may be gathered from the results of a study made by Dr. F. G. Nichols, of the Harvard

Graduate School of Education.[1] With the cooperation of 54 firms, employing 34,513 office workers, he secured detailed descriptions of the daily and occasional duties, the special requirements, and the essential traits for 43 types of office work. The results of the study are summarized in Table 44. In that table the symbols used are the following: O, ordinary; O−, below ordinary; O− −, very little; O+, above ordinary; OO, above ordinary to exceptional; E, exceptional; and N, none; 1, accuracy; 2, accuracy in details; 3, accuracy in figures; 4, cooperation; 5, concentrations; 6, courtesy; 7, judgment and clear thinking; 8, manual dexterity; 9, mental alertness; 10, systematic habits; and 11, willingness to assume responsibility.

TABLE 44.—SPECIAL REQUIREMENTS FOR OFFICE POSITIONS

Office trades	Executive ability	Knowledge of English	Ability in figures	Eyesight	Hearing	Physical strain	Essential character
Secretarial stenographer	OO	E	O−	O	O+	O	2, 9, 11, 10
Stenographer	O−	O+	O−	O+	O+	O	2, 8, 9, 5
Dictating-machine operator	O−	O+	N	O	E	O	2, 5, 8, 9
Bookkeeper	O	O	E	O+	O	O−	3, 5, 10, 11
Bookkeeping-machine operator	O−	O−	O	O+	O−	O	1, 8, 5, 10
Calculation-machine operator	O−	O−	O	O+	O−	O	8, 3, 5, 10
Multigraph operator	O− −	O−	O− −	O+	O−	O+	8, 1, 10, 5
Typist	O−	O	O− −	O+	O−	O	8, 1, 5, 10
Correspondent	O+	E	O−	O	O	O	7, 9, 6, 5
File clerk	O− −	O	N	O+	O	O	1, 10, 8, 4
Ledger clerk	O−	O−	E	O+	O−	O	3, 5, 10, 4
Statistics clerk	O+	O	E	O+	O−	O	1, 5, 10, 9
Cost clerk	O−	O−	E	O+	O	O	1, 5, 10, 4
Billing clerk	O−	O−	O	O	O	O	1, 8, 10, 5
Stock clerk	O−	O−	O	O	O	O+	10, 1, 8, 4
Cashier	O+	O	E	O+	O+	O	1, 6, 11, 9
Pay-roll clerk	O−	O−	E	O	O	O	1, 5, 4, 10
Timekeeper	O−	O−	O	O	O	O	1, 10, 6, 4
Shipping clerk	O−	O−	O	O	O	E	10, 4, 1, 8
Receiving clerk	O−	O−	O	O	O	O+	10, 4, 1, 8
Mail clerk	O−	O−	O− −	O+	O	O	8, 1, 4, 6

In the last column the numbers are given in the order of importance, the number listed first being the most important. Only the four qualities most frequently found are given in each case. Dr. Nichols adds to the list the following:

Loyalty was checked by every office manager in connection with nearly every job. It is apparent that the quality of loyalty is so universal a requirement as

[1] NICHOLS, F. G., *et al.*, *A New Conception of Office Practice*, Harvard University Press, Cambridge, Mass., 1927. A more recent study of the qualifications of stenographers and secretaries may be found in *Secretarial Office Practice*, pp. 120–132, by F. W. LOSO, C. W. HAMILTON, and P. L. AGNEW, The South-Western Publishing Company, Cincinnati, 1937.

to make it unnecessary to list it as one of the distinctive characteristics by which people will be helped in choosing from the various occupations open to them.

VALUE OF CLERICAL TESTS

The value of clerical tests has been repeatedly established; two reports will indicate their possibilities. Henry S. Dennison of the Dennison Manufacturing Company reports:[1]

At the Dennison Company the highest degree of success has been made with clerical applicants. On one series of tests 90 per cent of the high-score girls turned out to be satisfactory, and of this 90 per cent over one-third were out of the ordinary. Of those who made low scores, less than half turned out to be satisfactory clerks, and none of the low-score group have been in the out-of-the-ordinary class. With the clerical group alone through the use of tests, there has been an estimated potential saving of $50,000.

Another report, from Miss Marion Bills of the Aetna Life Insurance Companies,[2] indicates that properly selected tests may be used to select those who are to advance to positions of importance in the organization. In the Aetna companies all office positions are grouped into 14 levels, from A, low, to H, high. Employees were classified by Miss Bills in terms of their score range on a mental alertness test. Table 45 gives the per cent of employees in the different groups as well as the per cent who were advanced in one year to another group.

TABLE 45.—PER CENT OF EMPLOYEES IN DIFFERENT POSITION AND SCORE LEVELS (After Bills)

Score Range	Per cent in different groups			Per cent promoted 1 year	
	E–H	C and D	A and B	From D to E	From B to C
0–80	18	21	61	30	
81–100	22	26	57	61	20
101 and over	39	29	32		39

The results in Table 45 indicate that employees who score above 100 have twice as good a chance of reaching a responsible position as those with a score below 80; but they also indicate that nearly as great a percentage of those with a score above 100 remain at the lowest work levels as reach the highest. This would seem to lend support to two conclusions:

[1] DENNISON, HENRY S., The Selection, Assignment, and Training of Workers, *Personnel*, 7 (No. 2): 44–45, 1931.

[2] BILLS, MARION A., Intelligence and Clerical Jobs, *Personnel Jour.*, 12: 41–46, 1933–1934.

a. That tests alone are no guarantee of adequacy of selection.

b. That other factors than those measured by ability tests must be appraised if adequate selection is to be made.

The first conclusion has been reinforced by the results from a number of studies and by the increasingly common practice of adopting a wide variety of tests for types of work that may go under one name but that are inherently different from one another. An accepted practice in organizations that have conducted studies in ability tests over a period of years is the establishment of admission norms on a general ability test of the homemade or standardized variety, and the use of special tests

TABLE 46—WHY EMPLOYEES ARE DISCHARGED OR NOT PROMOTED

Deficiency or complaint	Hunt's results		Brewer's results	Ackerly's results
	Discharge	No promotion	Discharge	Discharge
1 Lack of skill	10 1	23 3	34 2	24
2 Attitude toward work	21 4	14 7	19 0	21
a Carelessness	14 1	7 9	2 7	14
b Tardiness	6 7	4 6		7
c Irresponsibility or unreliability	3	8	10 4	
d Unadaptability	3	1 4		
e Violation of rules			3 2	
f Loafing			1 8	
g Loitering			4	
h. Dissatisfied with job			5	
3. Attitude toward superiors or fellow workers	12 9	10 0	11 1	15
a. Noncooperation	10 7	6 7		10
b. Lack of loyalty	2 2	3 3		3
c. Insubordination or discourtesy			11 1	2
d. Troublemaking, fighting, or misconduct.			8 8	
4. Personal habits or weaknesses	35 7	35 6	9 3	34
a. Laziness	10 3	6 4	7 2	10
b. Dishonesty	8 1	1 2	2 1	8
c. Lack of initiative	7 6	10 9		7
d. Lack of ambition or effort	7 2	9 7		7
e. Insufficient care of clothing	1 6	3 0		
f. Self-satisfaction	9	4 4		
5. Outside Factors	16 4	11 7	17 6	8
a. Other interests	7 9	5 6		8
b. Absence	8 5	3 7	10 1	
c. Illness	0	2 4	4 1	
d. Drinking				
e. Miscellaneous			3 4	

for particular phases of possible tasks that applicants may be trained to undertake.

The second conclusion has received support from studies of reasons for dismissal or lack of promotion that have been made. The results of three studies are given in Table 46.[1] The factors are regrouped in five major categories: lack of skill, personal weaknesses or habits, attitude toward the work, attitude toward superiors or fellow workers, and outside factors. The significance of these forces in the determination of job permanence or job advancement will be noted in the chapters on Employee Morale and Employee Promotion. Some of the interesting facts that may be gathered from the table are:

a. The absence of some factors in some studies. For example, Brewer found no instance in which lack of cooperation was a cause for discharge, whereas Hunt and Ackerly found 10 per cent of discharges due to this cause; Brewer found no instance where "outside interests" were responsible for discharge, whereas Hunt and Ackerly found 8 per cent of discharges caused by that factor. On the other hand Brewer found "violation of rules," "loitering," "loafing," "troublemaking," "fighting," "misconduct," and "job dissatisfaction" responsible for 14.7 per cent of discharges, whereas Hunt and Ackerly did not discover these factors in any instance.

b. The apparent discrepancies when causes of discharge are categorized. The suggested categories may not be justifiable; however, they serve to group assumed causes. The discrepancies vary among the different investigators from 2.4 to 26.4 per cent.

It is obvious that there are other factors responsible for either discharge or lack of promotion than those enumerated in the tables, and that the attempt to categorize failure in terms of one factor is bound to lead to confusion and distortion.

c. The few cases where it is possible to reduce the cause of discharge to any one factor. Actions have a multiplicity of causes; the attempt to reduce these to one, at the time that an employment officer is attempting to accommodate an investigator and complete one of his many questionnaire forms, is more frequently an attempt to find a convenient way out than it is an attempt to make an analysis of the situation.

d. The differing interpretations that are given to commonly used abstract terms. These are responsible for attributing an act to one cause at one time and to another later. For example, "insubordination" can readily be interpreted as "lack of cooperation," "discourtesy" as "lack of loyalty," "irresponsibility" as "carelessness," and "loafing" and "loitering" as "laziness." This lends support to the oft-repeated complaint of the employment manager that the effort to reduce overt acts to abstract entities is the fad of the educationalist—and a useless one at that.

In spite of these discrepancies in the different reports, it is obvious that factors other than those usually grouped under "ability" are responsible for 80 per cent of failures in office situations. How to fore-

[1] Brewer's results are reported in detail in BREWER, J. M., *Bulletin* 45, Employment Management Series, No. 6, Federal Board for Vocational Education, Washington, D. C. Hunt's results are reported in HUNT, H. C., Why People Lose Their Jobs or Aren't Promoted, *Personnel Jour.*, 14: 227, 1935–1936. Ackerly's results are based on a study of 4,000 discharges in 76 business institutions, and are quoted by G. W. CLEETON in The New Approach to Employee Discipline, *Personnel*, 16 (No. 4): 199, 1940.

stall these failures and avoid their attachment to the working force is one of the most difficult problems that an employment manager faces. His consciousness of the importance of this problem is responsible for his interest in any tool that promises to be of value in analyzing personality, and is the cause of the frequent experiments with personality tests in the employment office.

Topics for Report

1. Analyze the various mechanical tests mentioned in the chapter, in a similar manner to the analyses made of clerical tests in Table 41

2 Select the machine-shop trade with which you are most familiar and suggest those tests that should have discriminative value. Why?

3. What tests would you suggest as of likely value in selecting office-machine operators? What for file clerks?

Required Reading

1. SCOTT, W. D., R. C CLOTHIER, S. B MATHEWSON, and W. R. SPRIEGEL: *Personnel Management*, 3d ed, pp 170–186, McGraw-Hill Book Company, Inc, New York, 1941
2. MOORE, H., in *Experience with Employment Tests*, pp. 11–29, Studies in Personnel Policy, No. 32, The Conference Board, 1941
3. BINGHAM, W. V. D. *Aptitudes and Aptitude Testing*, pp. 110–165, 278–329, Harper & Brothers, New York, 1936.

Supplementary Reading

1 PATERSON, D G, *et al* *Minnesota Mechanical Ability Tests*, University of Minnesota Press, Minneapolis, 1936
2. STEAD, W. T, C. L SHARTLE, and associates: *Occupational Counseling Techniques*, American Book Company, New York, 1940.
3. THOMPSON, L A: *Interview Aids and Trade Questions for Employment Offices*, Harper & Brothers, New York, 1937.

CHAPTER VII

PERSONALITY TESTS

CONDITIONS FOR APPRAISING PERSONALITY

Attempts to appraise personality cannot be valid unless two conditions are met:

a. The theory of personality that the appraisal form implicitly adopts must be comprehensive and consistently maintained.

b. The technique of appraisal must be as reliable as comparable techniques in use in other fields of human analysis.

In order to provide a basis for appraising the tools of personality analysis that have been offered to the employment manager, the various theories that underlie representative forms of personality analyses that are in use in the employment office will be summarized. There is no field of analysis in which there has been a wider collection of tools and a smaller variety of fundamental assumptions than in the field of personality analysis. The tools have been associated with every movable part of the anatomy, with every type of expressive behavior, with nearly every internal organ in the body, and with every type of aspiration, hope, desire, and value of which the human mind is capable. The assumptions, through the ages, have been of two fundamental types, unitary and multiple; they have varied in form and method of proof of value, but they have been consistent in the adoption of one factor in terms of which every human quality may be appraised, or in the adoption of a multiplicity of factors in terms of which the assumed basic forces may be evaluated and the accessory forces seen in the light of their contribution to basic and relatively isolable entities.

UNITARY THEORIES OF PERSONALITY

Such theories are based on the assumption that one factor is responsible for whatever form personality may take, for whatever level it may attain, or for whatever quality may be its outstanding characteristic. The factor may represent itself in expressive form or in ideational or motivational form. In expressive form, the manner of expression is assumed to be indicative of the personality, whereas in ideational form it is supposed to be the driving force back of personality. The expressive symptoms have covered the entire organism: the shape of the head, the form of the face, the color of the hair and eyes, the linear relation between

the parts of the body, the shape of the legs, the manner of walking, the shape of the hands, the pattern of the lines in the palm of the hands, and especially the manner of writing. The ideational or motivational forms have appeared under different rubrics: *types*, such as physical, intellectual, emotional, glandular, and temperamental; *values*, such as social, economic, theoretical, practical, and religious; *integrations* of the physical, mental, emotional, or glandular systems; and *drives* in the form of goals, objectives, or ambitions. Supporting this "internal" method of diagnosing personality have been such concepts as "the integrative action of the nervous system," "the organization of the personality under the dominance of one objective," "the synthetic unity of apperception," and the levels attained by heroes of history who have been controlled by "this one thing I do." An estimate of the value of these unitary systems can be gained from an examination of one of each of the external and internal methods. Inasmuch as handwriting and psychoanalysis are the two single-system forms with which the employment manager is most frequently confronted, their technique and possible value will be appraised.[1]

1. Handwriting.—The popularity that this tool has received because of the wide use made of the Katherine Blackford system of character analysis, and the sponsorship that it has received from such an authority as Robert Saudek[2] have been responsible for its widespread use and for confidence in the results from its disclosures. The system is based on the theory that handwriting is a complex pattern that may be reduced to a number of specific symptoms, and that these symptoms express definite characteristics. Their symptoms or writing peculiarities are somewhat as follows:

Symptom	Character Trait Indicated
Upward sloping lines	Ambition, pride
Heavy lines and heavy bars over the *t*'s	Forcefulness
Consistent and continuous heavy lines	Bashfulness and timidity
Writing too slanted	Slowness, sluggishness
Closed *a*'s, *o*'s, and *d*'s	Reserve, caution
Open *a*'s, *o*'s, and *d*'s	Dishonesty
Long bars over *t*'s	Perseverance

The system may be examined from two standpoints, first from the standpoint of the results that are gained when the analyses of college

[1] An examination and appraisal of the commonly used expressive forms will be found in LOCKHART, E. G., *Improving Your Personality*, pp. 6–22, Walton Publishing Company, Chicago, 1939; HULL, C. L., *Aptitude Testing*, pp. 111–115, World Book Company, Yonkers-on-Hudson, New York, 1928; SYMONDS, P. M., *Diagnosing Personality and Conduct*, pp. 503–530, D. Appleton-Century Company, Inc., New York, 1931; and PATERSON, D. G., and K. LUDGATE, Blond and Brunette Traits, *Jour. Personnel Res.*, 1: 122–127, 1922.

[2] SAUDEK, ROBERT, *Experiments in Handwriting*, William Morrow and Company, Inc., New York, 1928.

students, amateurs, and local graphologists are checked against the results of analyses from rating scales, personality tests, and summarized life stories; and it may also be appraised by comparing the results from trained graphologists with the results from the best available psychological tools.

The results from the former have been consistently negative; from the early experiments by Hull and Montgomery[1] to the latest, the results have rarely been better than chance, and frequently have been below that. The results from one study are typical; Middleton[2] asked 98 students at DePauw University to judge the intelligence of 20 other students from their sampled handwriting, and correlated the results with the students' decile ranking on the 1938 American Council on Education Psychological Examination. He found a zero correlation for both men and women subjects, although he found a degree of conviction of value in the accuracy of judgments when the subjects were rated the second time, and found a reliability coefficient of .48 for the men judges and .64 for the women. In a second part of the same study Middleton secured sample handwritings of 14 subjects, from fifteen to seventy-five years of age. He then asked 113 judges to rate them for apparent age, and checked the results against known ages. The correlation was .25 (.29 for the men and .24 for the women), although the reliability coefficient, when first and second judgments were compared, was only .28.

The variations in these correlations are representative of the results from other studies; when some qualities are rated, even by the untrained, the correlations are from 10 to 25 per cent better than chance. Neatness, age, and occupational class have occasionally been "spotted" by untrained examiners.

When the results are checked against professional graphologists, the disclosures are frequently of a surprising nature. Saudek reports that he had collected 73 specimens of handwriting from 73 businessmen, and interpreted 19 of them as belonging to dishonest people and 54 to honest. Different firms confirmed the accuracy of his diagnosis in 14 of his 19 "dishonest" cases; all 14 either were convicted in courts or confessed their guilt. An experiment conducted by Dr. Edwin Powers of Dartmouth College seemed to indicate that graphologists were able to match handwritings of barbers, postmasters, and college students better than either undergraduates or faculty[3] could do. He asked 10 adults (2 members of

[1] Hull, C. L., and R. B. Montgomery, An Experimental Investigation of Certain Alleged Relations between Character and Handwriting, *Psychol. Rev.*, 26: 63–75, 1919.

[2] Middleton, W. C., The Ability of Untrained Subjects to Judge Intelligence and Age from Handwriting Samples, *Jour. Applied Psychol.*, 25 (No. 3): 331–340, 1941. See also a letter on pp. 357–358.

[3] Graphic Factors in Relation to Personality, 1930, reported in Allport, G. W., and P. E. Vernon, *Studies in Expressive Movement*, pp. 212–223, The Macmillan Company, New York, 1933.

the faculty, 3 undergraduates, 2 graduate students, 1 student who had just left college, a postmaster, and a barber) each to copy a passage of 40 words. Photostatic reproductions of these were made and submitted to three classes of judges: 143 male undergraduates, 25 members of the college faculty, and 17 professional graphologists. A sketch of each subject who gave his handwriting was made by three psychologists in collaboration; in this the outstanding traits were delineated as comprehensively as possible, emphasis being placed upon the subject's interests, attainments, and habits. The judges were then given the sketches and the handwriting specimens, and were asked to match each specimen with its appropriate sketch. The frequency of the correct matchings is given in Table 47.

TABLE 47.—FREQUENCY OF CORRECT MATCHINGS OF HANDWRITING AND CHARACTER DESCRIPTIONS, IN PER CENTS
(After Powers)

Subject	Undergraduates	Faculty	Graphologists	Combined
Barber	47.6%	36%	52.9%	46.5%
Faculty (theology department)	21.0	48	41.1	26.5
Graduate student (a)	23.1	20	35.3	23.8
College student	16.1	16	58.8	20.0
Graduate (commerce)	18.9	24	11.7	18.9
Graduate student (b)	16.1	8	0.0	13.5
Postmaster	11.9	12	17.6	12.4
Faculty (psychology department)	9.8	4	5.9	8.6
Graduate student (c)	8.4	8	11.7	8.6
Graduate (business)	4.1	4	5.9	4.3

From Table 47 it will be seen that 50 per cent of the undergraduates and the graphologists identified the barber's handwriting from the character sketch. However, it is apparent that there were cues other than character sketch to aid the identification. Legibility of handwriting frequently improves with educational level; it is to be expected that when there are wide differences in educational training there should be marked differences in handwriting; the fact that this played a part is seen from the small percentage of identifications among the faculty. The one interesting fact about the experiment is the number of college students who were identified by the graphologists—when nine of the graphologists can separate the writing of one student from that of five others and match it with a character sketch, there must be identifying elements in terms of which the qualities expressed in the handwriting are also in the character sketch. However, the fact that eight of them failed to make

the matching indicates their acceptance of a tool that would discredit any scientist.

Whether or not handwriting has any relation to character qualities is yet to be shown.[1] A priori, there ought to be some relationship. One's method of writing, as well as one's method of talking, walking, or any other form of expressive behavior, indicates the presence of well-established patterns, which may be symptomatic of the composite of patterns which make up the self. However, there is some doubt about the representativeness of any one pattern. Behavioral patterns are not of the nature of peas in a pod; they bear the stamp of uniqueness. They vary in strength, intensity, persistence, and forms of expression, and may not at any one time be truly representative of the composite pattern or of the dynamic organism that they may to some extent express.

Regardless of the negative or but slightly better than chance results from academic experiments there are definite weaknesses in graphology that undermine its value in the employment office. The significant weaknesses have been pointed out by Allport and Vernon as these:

a. The absence of proof that all features of the personality express themselves with equal clearness in one's handwriting. Some qualities may lend themselves to expression through that medium and be appraised. One's handwriting can be in such a clumsy, neat, graceful, or expansive form that any discerning person can be impressed because of it. However, to infer that neatness in handwriting is a guarantee of neatness in dress, in caring for responsibilities, or even in so closely related a task as keeping books is to assume that one particular is symptomatic of a general quality. Recent experimental work has repeatedly given contrary proof.

b. The tendency of graphologists, in common with many professed characterologists, to use generalities and multiple options, instead of specificities. To tell a person that he is expansive or bashful is to reveal nothing that a good interviewer cannot learn in the first 5 minutes of an interview. The tools that scientists put into the hands of employment managers must supplement already accepted tools, and must provide information that existing ones do not offer. That information must be specific if it is to be of value.

The objections that are raised against graphology are multiplied when less complex objective symptoms are used; they all fail as an employment tool because of the insecure basis on which they rest.

a. They assume that one form of behavior is symptomatic of the whole of a person's form of expression; the weakness of that assumption will be apparent if an attempt is made to compare method of talking with method of walking. The assumption that one muscular pattern can express the entire personality is one that has never received credence in the psychological laboratory; the most that can be said for any muscular pattern is that its level of adjustment will probably equal the level that has been attained by another pattern; as a form of expression it reveals what has been acquired under such guidance as has been effective in the molding of one pattern in terms of a system or need.

[1] ALLPORT and VERNON, *op. cit.*, pp. 211–233.

b. It fails to recognize the social significance of personality, and the daily variations in those aspects of personality that are of little temporary significance. If personality were to be conceived as a permanent structure around which created things revolved, there might be some justification for confidence in the forms of expression of one symptom; when, on the other hand, social demands are in constant flux, and when values that are important today vanish into insignificance as soon as they are realized, the one feature that characterizes personality is its variability. The issue with which an employment manager is concerned is the nature of the variation and the qualities with regard to which inflexibility rather than variation is the keynote.

c. It assumes that the personality is expressed in overt form; the mechanistic form of behaviorism that supports this assumption had its heyday in the second decade of this century; when physicists, biologists, and chemists accept a teleological or dynamic interpretation of isolated forms of minute behavior, there seems to be little justification for those whose experimental tool is the entire organism to adopt an outmoded basis for interpreting personality.

d. In spite of the elaborateness that has characterized some single-system descriptions, the demarcations of character that it may make possible are still not distinct enough for the employment manager. To tell an officer that a candidate is expansive means—just what? He is interested in knowing how well Jim will like or be liked by his boss and fellow workers, how reliable he will be when he is left alone, how careful he will be over the property of others, and how loyal he can become to the organization. Abstractions and generalities have their value in the employment office only to the unsophisticated—and they seldom remain on the job long.

2. Psychoanalysis.—The theories that have appeared under this title have been associated with the names of Freud, Jung, and Adler. Freud based his theory on the assumption that the most important determinant of personality was sex, and assumed that because direct expression of sex was not permitted in the social order, the manner in which the sex urge was curbed, redirected, submerged, or permitted freedom of expression determined the composition of the personality. The method that he advocated as a means of discovering the manner in which a mature personality resulted from these unsuccessful or semisuccessful efforts was a catalogue of covert and overt efforts at releasing the energy. The covert attempts may be conscious or unconscious and may have reached as far back in the person's history as childhood; the overt attempts have been responsible for attitudes toward society's impositions. The extent to which these efforts were successful—when by success is meant the degree of adjustment of internal urges to societal demands—indicated the extent to which the personality was well or ill balanced. The tools that were advocated for the unearthing of unsatisfactory aspects of that urge were in the nature of "asides": behavioral symptoms that were manifest when a person was off guard, dreams, slips of the tongue, misunderstandings, association trends, and unguarded conversations.

Jung based his theory on the assumption that the driving force in personality is in the form of dynamic energy, a kind of *élan vital,* a creative urge that manifests itself in the craving for self-expression. The

wholesome personality is the one that has given unrestrained expression to that urge; the distorted personality is due to a redirection of the basic urge into the channels that will not permit free expression. The technique for diagnosing distortion is a prolonged series of directed self-expression, accompanied by analyses of association trends and dream experiences.

Adler based his theory on the assumption that were it not for a feeling of inferiority human nature would express itself in a natural form and personality would be governed only by environmental factors. But, comparison with others gives every person an opportunity to feel inferior; the young compare themselves with the old, the poor with the rich, the homely with the attractive, the rural with the urban, the people with one talent with those who have ten, and the members of one sex with those of the other—and everyone finds something in the possession of others that he lacks and cannot easily get. This consciousness of lack results in a feeling of inferiority, the destruction of which is necessary if balance is to be restored to the personality. The tool that is advocated for the removal of this encumbrance is the confidential revelation of one's buried distresses and the replacement of those environmental factors that are constant reminders of weakness.

The employment manager has no need to be versed in psychoanalytic theory in order to do an acceptable job in selection; he does need to know sufficient about the basis on which the theory rests to be able to withstand the offers of those who attempt to peddle their wares and to provide a solution for every troublesome problem that he has. In any form of psychoanalysis these are the fundamental weaknesses:

a. They represent single, wholesale systems of personality analysis; they reduce the complexity of human nature to one factor and try to account for every human variance in terms of its expression or inhibition. Such a simple substance as the water we drink has two constituents.

b. At their best they represent systems for diagnosing the mentally and emotionally diseased. Unfortunately, some of those who present themselves as candidates to the employment manager are in that class; the tools that may be used in spotting them are in the possession of clinicians, and cannot be readily acquired by the employment manager; besides, they are easily distorted and misinterpreted when they are used.

c. Such systems make no pretense at appraising the factors in the personality with which the employment manager is most concerned; his need is to know how reliable the candidate is, how responsible he is, how well he will cooperate with others, and how long he will stick. Small differences in common human qualities are not disclosed by the use of tools that categorize candidates into levels because of the variations in amount and manner of expression of one assumed force.

MULTIPLE THEORIES OF PERSONALITY

The multiple theories have been based on the assumption that personality is a compound that manifests itself in a variety of ways and that

is composed of a number of related or dissimilar elements. The existing theories can be divided into two groups, typological and analytical.

Typological Theories.—These have been based on the assumption that people can be divided into a number of groups; the group to which a person may belong varies according to the classification system devised by the author. Any person may belong to one particular group in a number of systems, but never to more than one group in any one system. The systems that have been suggested have been of various types and kinds. Table 48 summarizes the most common systems and gives some indication of the implications of the system.

TABLE 48.—TYPOPOGICAL SYSTEMS OF PERSONALITY ANALYSIS

Type of system	Groups in system	Implications of system
1. Reaction method	*a.* Sensory	*a.* Predominantly attentive to sensuous stimuli
	b. Motor	*b.* Primarily interested in activity
	c. Mixed	*c.* Alternates between *a* and *b*
2. Imagery type	*a.* Visual	*a.* Thinks in visual patterns
	b. Auditory	*b.* Thinks in terms of sounds
	c. Kinaesthetic	*c.* Thinks in terms of movements
	d. Tactual	*d.* Thinks in terms of sensory experiences
3. Racial	*a.* Leiotrichous	*a.* Straight-haired people
	b. Ulotrichous	*b.* Woolly-haired people
	c. Cymotrichous	*c.* Wavy- or curly-haired people
4. Physical	*a.* Respiratory	All of which are characterized by the predominance of one system that determines the field of interest and personality of the occupant
	b. Digestive	
	c. Muscular	
	d. Cerebral	
5. Bodily	*a.* Asthenic	*a.* Delicate, nearly childlike
	b. Athletic	*b.* Massive, the aesthetic ideal
	c. Pyknic	*c.* Roundness, freedom, and ease
6. Temperamental	*a.* Cyclothymes	*a.* Tough realists, socially inclined
	b. Schizothymes	*b.* Romanticists and idealists
7. Valuational	*a.* Theoretic	*a.* Chief interest in principles
	b. Economic	*b.* Appraises everything in terms of cost
	c. Political	*c.* Constantly seeking power
	d. Aesthetic	*d.* The art lovers
	e. Social	*e.* The Emily Post devotees
	f. Religious	*f.* Guided by the verities

Supplementing these would-be-complete classifications of the human race are the various dichotomous systems that assume that they have completely described an individual when they have located him in one of two classes: *e.g.*, the tough minded or the tender minded, the masculine or the feminine, the introvert or the extrovert, the subjective or the objective, the sthenic or the asthenic, or others among the collection of

contraries that have borrowed their appellation from commonly accepted characteristics.

Advocates of one or more of these types frequently find their way into the employment office, and repeated instances are given where employment managers are a prey to their implications: the devotee who looks to the Czechs for very skilled work, to the Swedes for steady work, and to the Irish for risky work is implicitly accepting the assumption that national boundaries create types and that categorizing a person in a type assures management of satisfactory work.

The objections against this method of understanding personality have been well established; they may be summarized in this way:

a. They assume that aspects of human nature, traits, qualities, and characteristics are discontinuous, exist as independent entities, and act in isolated fashion. This has long since been abandoned as a means of mental classification.

b. They base their categories on isolated cases; in that respect they resemble much of the reasoning carried on in the employment office. The isolated case of the test-selected employee who did not measure up to expectations or who did more satisfactory work than tests promised is somewhat similar to the isolated cases on which typology rests.

c. They exist in the mind of the classifier rather than in the person of the candidate. The type stands for a collection of attributes that have been assigned to a person because of a few assumed or apparent symptoms. They are the stamp of condemnation or approval that one theorist puts on those who seem to lend support to his system.

Analytical Theories.—This method of analysis has been that most commonly sponsored by psychologists and psychiatrists; it has assumed that a personality is a totality that may be reduced to a number of elements, factors, traits, or entities; by cataloguing the most significant elements and providing statistically reliable tools for estimating the strength of each one, it has been assumed that the basic forces that constitute the personality will lend themselves to estimation. The elements that have been assumed to be the pivotal forces in personality vary; at times they have been related to concepts that have been borrowed from psychiatry, at other times they are related to social concepts, and at other times they are categorized in terms of objective values. Sometimes they are grouped together, without being labeled, and serve as the basis of an over-all score to indicate the stability level of the candidate.

The analytic method has approached the problem of personality analysis from two angles—one that attempts to analyze the person as an isolated entity apart from and independent of his environment, and one that relates the analysis to situational demands. The former analyzes the person without any regard to the varying factors that affect the personality from day to day under different environmental conditions; the latter analyzes the situational demands and seeks, not an analysis of

the personality, but an estimate of the extent to which the situational demands may likely be met by the individual. The former is an attempt to analyze the whole person, while the latter makes no pretense at analyzing the entire person; its sole interest is the extent to which the person may be able to cope with those pivotal demands that are uppermost in the situation.

TESTS FOR ESTIMATING PERSONALITY

The tools that are available for estimating personality may be divided into two groups that the above principles of analysis follow. In the first group are the most commonly found personality tests; in the second group there are few standardized tests. Most of those that are available are homemade, are constructed to meet the demands of a particular situation, and are rarely transferable to any other situation. The former usually center their attention on one, two, three, or more significant homogeneous patterns, and provide means for estimating the strength of each pattern. The latter attempt to gain estimates of likely ways in which situations will be met by surveying the manner in which comparable situations have been met in the past.

The technique that is adopted by the two methods is essentially the same. Issues with which the candidate has had real, reported, or imaginary contacts are described in question or situational form, and the candidate is asked to indicate his attitude toward, his experience with, his feelings about, or his thoughts on the issue. Opportunity is given him to express his feelings, etc., in one of a number of forms: opposition, agreement, neutrality, halfheartedness, or rank order. Each alternative is given a weighted value, and in terms of the total scores on individual patterns the candidate is labeled as, say, 20 per cent more aggressive than the average, 30 per cent less neurotic than inmates of psychopathic wards, 40 per cent less social than Emily Post's ideal, or 50 per cent more self-sufficient than people of his or her own age. The tests that are available are being divided into two groups: trait tests and situational tests.

TRAIT TESTS

The tests in this group have included estimates of thought processes, reaction tendencies, behavioral patterns, past and present and possible future behavior, beliefs, feelings, values, and judgments of self. They have included one, two, three, or more patterns, according to the system of thought on which the test was constructed. The following represent the various types.

1. Association Tests.—These tests work on the theory that "as a man thinketh in his heart so is he." By a careful selection of key words that will or should evoke varied thought patterns, a number of stimulus

words are given to candidates, who are asked to respond to each with the first word that occurs to them. The manner in which the responses agree with the majority indicates the commonness or unusualness of the patterns of thinking of the candidate. By comparing responses with those common to particular occupational groups, the diagnostician gets an estimate of the "line" that is pursued by candidate's hopes, ambitions, and thoughts. On the assumption that thought patterns and activity levels parallel one another, he thereby labels the candidate as a potential leader, a social misfit, a hail fellow well met, or a jack-of-all-trades.

The objections to this method of personality analysis have been well established.

a. Although association patterns are built up by training and experience, the recency of any experience is bound to affect the type of response; and the resulting pattern, while undoubtedly significant as an index of currently disturbing problems, has little significance as a tool to disclose the likely behavior of a person in a particular situation.

b. This method assumes that logic and reason govern personal behavior, and that thought is the mainspring of action. For a quarter of a century the dynamic psychologists have been giving proof to the contention that the mainsprings of human activity are to be found in the energy systems and predetermining tendencies that are related to one's ambitions, hopes, and aims.

c. It is governed by the statistical fetish in which it is assumed that characteristics that conform to a standard pattern are of the same type. Even the simplest acts of two different people that superficially are the same may be produced by different factors and for different ends. Superficial similarity is no reliable index of basic equality.

The chief value of this tool has been as an aid to those who are psychoanalytically inclined; the recurrence of similar patterns of thought from dissimilar stimuli gives an indication of the significance of the pattern in the person's thought and emotional life, and may indicate the seriousness with which a system of experiences is disturbing the person.

2. Contrasting-pair Tests.—Tests that may be put into this category have been of many types and are widely used; those most commonly found in the employment office are tests of ascendance-submission, introversion-extroversion, masculinity-femininity, and depression-elation. Essentially these are type tests, and are based on the assumption that mankind can be grouped into two opposite classes that are at opposite poles to each other.

The inspiration for this type of test came from a list of "traits of introverts" that was compiled by Max Freyd. This was followed by a list of opposite traits that were supposed to characterize extroverts. Following these two lists came a series of "yes-no" and "true-false" questions, the answers to which determined the level of introversion or extroversion of the candidate. Tests to measure that level have been

issued by Laird, Neymann and Kohlstedt, Bernreuter, Bell, Heidbreder, Conklin, and Root. The reliability of such tests rarely reaches the desired ratio of .9, and the validity is known only by the extent to which one version of the test correlates with a previously published version by another author.

Of the contrasting-pair types of tests, the most frequently used is the Allport A-S test, particularly the Beckman revision.[1] This consists of 27 questions of the problem-situation, multiple-choice type, and has been standardized on a small group of businessmen. The following two problems will illustrate its nature:

4. A salesman in a man's shop takes great trouble to show you a quantity of merchandise; you are not entirely suited; do you find it difficult to leave without making a purchase?

Frequently__________
Sometimes__________
Not at all__________

9. Do you feel nervous or ill-at-ease in the presence of a superior in the business world, the president of a large corporation, for example?

Frequently__________
At times__________
Never__________

Each type of reply is given a weighted score, on the plus side to indicate aggressiveness, and on the minus side for submissiveness. Table 49 gives the median, mean, and range of scores made by a number of representatives of different occupations.

TABLE 49.—DISTRIBUTION OF SCORES ON THE A-S TEST IN DIFFERENT OCCUPATIONS

Group	Number of cases	Range of scores	Median	Mean
		+ −		
College juniors and seniors	50	29–35	−1.0	−1.0
Applicants for position of student managers	40	33–21	.5	1.1
Managers of variety stores	110	44–26	8.0	7.7
Production tracers	30	25–16	1.0	1.8
Field salesmen	40	24–14	6.5	5.7
Junior executives and technicians	55	29–23	1.0	3.3
Public utility workers	16	14–23	−4.0	−8.5
Shop foremen	26	32–33	− .5	0
Insurance salesmen (in training)	110	32–31	2.8	4.0
Junior executives	20	23– 8	4.5	6.0

[1] BECKMAN, R. C.: Ascendance-submission Test, Revised, *Personnel Jour.*, 11: 387–392, 1932–1933.

Beckman concludes, after having used the test in a number of organizations, "the test is particularly useful for personnel directors engaged in recruiting." A study of the differential value of this test was made by Stevens and Wonderlic[1] in a large finance company. It was given to 201 applicants for positions, 141 branch office managers, and a few representatives in other positions. The results from the study are given in Table 50.

These results are slightly disquieting. One would expect clerical workers to be less aggressive than salesmen, but they average eight points higher; the results from 201 applicants did not give a normal distribution; there was no pronounced modal class interval; and the correlation between the test results and results from the Otis Test of Mental Ability was high enough (.30) to indicate that there was an overlapping in the abilities measured by the two tests. It is this confusion of results that characterizes most tests of personality, when given to different groups, and makes job analyses in terms of the particular demands of each situation a necessity before one can be dogmatic concerning the type of person who best meets the demands of a particular situation.

TABLE 50.—DISTRIBUTION OF SCORES ON THE A-S TEST IN ONE ORGANIZATION

Group	Number of cases	Range of scores	Median	Mean
		+ –		
Applicants for positions	201	44–26	9.5	10.37
General salesmen	70	18–26	4.5	3.08
Junior executives	22	49– 9	15.0	12.40
Salesclerks	21	13–12	5.0	6.33
Clerical workers	33	42–16	13.0	11.54
Branch office managers	141	35–22	5.3	5.38

The results from Beckman's test are sufficient to indicate the dangers to which such tests are heir.

a. Contradictory results from the same test are frequently obtained when the test is given to ostensibly similar workers, or at least to employees successfully doing similar types of work.

b. The concept that is used to group candidates is an artifact—a superimposed label for a collection of assumed similar types of activity. To group eating, laughing, crying, smiling, chewing, and facial contortions into one pattern and call them "faciology" has just as much meaning as to group the types of activity of a person at a baseball game, in church, at the table, at a formal reception, in a standing line, and in the classroom in one category and label it with an unfamiliar title of foreign origin. Calling names is neither defining character nor analyzing personality.

[1] STEVENS, S. S., and E. F. WONDERLIC, The A-S Reaction Test, A Study of Beckman's Revision, *Personnel Jour.*, 13: 222–224, 1934–1935.

c. It assumes a general trend from a miscellaneous collection of particulars. That unquestionably is the scientific method of making inferences; but the bases on which the inferences rest must be known. To say that because a person pushed another person out of the way when he was last standing in line he will be likely to do it again is just not true to experience. Why did he do it? What were the provocations? How strongly was he motivated? Acts, to be understood, must be interpreted in terms of motivations, not of appearances.

3. Multiple-trait Tests.—These differ in form and content from the contrasting-pair tests only in the fact that they include a larger collection of items and a number of related or unrelated assumed patterns. Their results are interpreted as an over-all score to represent the stability of the personality in comparison with the group on whom the test has been standardized, or a number of subscores to represent a similar standing with regard to the patterns that the separate collection of items or different weights of groups of the same items produce.

TABLE 51.—PERSONALITY TESTS OF THE MULTIPLE-TRAIT TYPE

Name of Test	Comments
1. Woodworth P. D. Scale	1. Based on the most common neurotic symptoms characteristic of patients in psychopathic wards, it attempts to discover the frequency with which these symptoms appear in male adults. An over-all score indicates level of stability
2. The Thurstone Personality Schedule	2. This is based on and patterned after the Woodworth Scale, standardized on college freshmen, and designed to discover the students who may not stand the strain of college work and life
3. The Bernreuter Personality Inventory	3. This combines measures that had been made of a number of patterns: neurotic tendency, self-sufficiency, social ability, introversion-extroversion, dominance-submission, and self-confidence, and gives percentile ratios for each pattern
4. The Psycho-Somatic Inventory	4. This includes 92 questions, half concerned with psychological problems and half with physiological. Its difference from other tests in this group lies in its provision for any one of four responses instead of the yes-no provision of the other tests
5. The Humm-Wadsworth Temperament Scale (See Experience with Employment Tests, *Studies in Personnel Policy*, No. 32, The Conference Board, New York, 1941.)	5. This is based on the Rosanoff Theory of personality; *viz.*, that personality has five chief components: normal, hysteriod, cycloid (manic and depressed), schizoid (autistic and paranoid), and epileptoid. The dominating component indicates the personality trend

In both the experimental laboratory and the employment office this type of test has been used more widely than any other. An estimate of its potentialities is warranted. The tests that belong in this category, together with the aspects of personality that they appraise, are summarized in Table 51.

The value of such tests as these has been a moot issue for a decade. They have been hailed as saviors, thrown aside with contempt, or looked upon as the childish playthings of the academicians. Their potential values have often been ignored, and the dangers to which they lend themselves have often been lost sight of. Their possible values are in three directions.

a. They give a person an opportunity to compare himself with others, and give one person an opportunity to appraise those in whom he is interested by checking their responses with those given by others. But for them, one would have very few opportunities to compare himself with thousands of others on how he feels about a number of issues, how he acts in comparison with others, how his past behavior is or is not representative, and how his pattern of development conforms or does not conform with the *status quo.* This opportunity for comparison of self with others has had a leavening effect on some, a heartening effect on others, and has been a disquieting blow to many.

b. They have served to popularize a number of psychological concepts and extend the area of their usefulness. Before their advent, who ever heard the terms extroversion, self-confidence, submissiveness, and paranoia in use in the employment office? Their use may be misplaced and the meanings attributed to them may be quite different from those intended by their definers, but they fly around the conference room with the greatest of ease—and with an air of finality.

c. They have served to focus attention on desirable and undesirable patterns of behavior, and have served as anchorage points, ideal goals to attain, or pitfalls to avoid. Thus, they have served as motivational forces in the renovation of a personality or in the development of an individual in terms of apparent demands. The social misfit has been induced to acquire social finesse because of their revelations, the self-centered individualist has been brought out of his shell, the extrovert has had his heart removed from his sleeve, and the suspicious paranoiac has been led to trust and believe in others. Thus, by popularizing desirable standards of behavior they have indirectly set standards in terms of which acceptability has been defined.

The dangers of such tests have been the cause of their downfall; in spite of the temporary popularity of now one, then another, they have not succeeded in establishing for themselves so reliable a place in the employment office as has the much-maligned recommendation. Their dangers are seen to be in such varied directions as the following:

a. Their form of construction, whether of the yes-no or of the multiple-choice type, encourages deceit. The candidate in the employment office is not a distressed patient looking for help and ready to disclose the depths of his being; rather, he is on guard, anxious to show himself in his best dress, and frequently all too eager to conform to apparent demands. Candidates who are intelligent enough to understand the questions in such tests are also intelligent enough to see the effects that adverse answers

may have on their prospects of landing a job. Some, frequently the naïve, tell their worst experiences, feelings and fears.

b. They form a hodgepodge of miscellaneous and apparently unrelated items without any evidence of the nature of the underlying current that they are attempting to sample, or without any proof that there is any consistent theory or understanding of personality. There are one or two exceptions, but the theory on which these exceptions are based is disputed by as many as accept it. To test personality, one of the obvious prerequisites is a definition. To disclose that a personality has an undue number of abnormal symptoms or has an exaggerated dose of some one hypothetical pattern is neither an explanation nor a condemnation. Sound practice is based on a sound, comprehensive, and consistent theory.

c. They are frequently divided into a number of units that are interpreted as distinct and separate entities. The units are armchair labels that are attached to a collection of forms of behavior that are assumed to have either internal or external relatedness. The labels that are given the units vary, their supposed contents are added to or subtracted from at will, their overlapping with other assumed units is frequently shown, and their division into supposedly simpler and smaller units occasionally appears. One needs only to review the work of Flanagan on the Bernreuter test and Guilford on items in extroversion-introversion tests to get illustrations of both reduction and extension. Units that are so fluid are not likely to be accepted as ultimates.

d. The test items are usually translated into statistical values that are most commonly weighted in inverse ratio to the frequency with which they are checked. The values are usually statistically valid and humanly useless. One illustration will indicate the danger of placing undue confidence in statistically valid results. One subject scored "average" on two personality tests; both tests included but few items that were related to suspicious tendencies. Every person who worked with the candidate was aware of his lack of trust of others, his suspicious attitude toward every comment or suggestion made by anyone else, and his inability to place confidence in or give responsibility to anyone. The person was a misfit, was impossible as a coworker or as a leader, and was considered for discharge. The raw or weighted score from the test failed to reveal any disturbance; the conference that resulted from an analysis of significant disclosures in the test served both to unearth the issue and to show the importance of the trend in the person's life.

e. Probably the greatest danger that has resulted from such tests lies in their wide distribution and frequent misuse and misinterpretation. The test is a convenient tool in the hands of the clinician. But what clinician will dare to use the tools of a member of another profession? The danger which may result from the use of such a tool is enhanced manifold when amateurs, adolescent therapeutists, and would-be mind-and-soul analyists are given freedom in exploiting or abusing its possibilities.

f. Then there are minor issues related to the attitude that a subject takes toward the test. Will he answer the test queries honestly? Can he answer some of the questions honestly? How significant will a revelation of childhood or adolescent behavior be? Even if the whole truth is told, how significant is it? Some people may have been afraid in the dark in childhood and have answered "Yes" to such a question, although they may have overcome their fear, while others may still retain it; among those who still harbor the fear some may get a thrill out of the experience, others may have had a succession of experiences that make fear of the dark room a protection. This one issue will serve to indicate the manner in which such tests fail; revelations of experience are not so significant as is the importance of the experience in the life of the person now; the test disclosures are fruitless and meaningless unless the leads that they offer are used as guides to help appraise the significance of the

experience in the life of the candidate. What effect has the experience had on his present system of values, on his attitude toward issues that are everyday problems, and on what he expects to take from or give to life? Directed interviews that are enriched because of the revelations of honestly answered tests are the only known ways to discover the answers to such questions. Until these answers are obtained, the profile that results from tests and the deviations from normality that such profiles disclose provide convenient labels but have no meaning.

Situation Tests

The standardized purchasable tests that might conceivably be classified in this group have been few; among those that have appeared, the three that have given most promise are the following:

The California Test of Personality.—This test is definitely related to late adolescent problems, divides these problems into two major groups, self and social, and subsums under each group five different aspects for appraisal.

The Bell Adjustment Inventory, Adult Form.—This consists of 160 questions of the yes-no type divided into five groups: home, health, social effectiveness, emotional balance, and occupational adjustment.

The Adams Personal Audit.[1]—This is designed for general business situations, and includes nine aspects: sociability, suggestibility, irritability, rationalizing tendency, anxiety tendencies, conflicts, intolerance, flexibility, and worry.

The standardized homemade tests, to meet the demands of a particular situation, have been limited to those few cases where accredited psychologists have had opportunities to select from established issues and techniques those parts that have some relation to the problems in the particular company; and from a study of company needs and the factors that make for success they have evolved test batteries that appraise those aspects of personality that are pivotal to job demands. Homemade tests have been developed for two types of situation.

In situations of the first type the tests are used as supplements to ability tests, where their primary value lies in weeding out from among those who have the capacity and training demanded by the job the candidates who are likely to be misfits because of the presence of personal conflicts, the threat of social maladjustment, or the possession of an undesirable psychotic pattern. In this type of situation the most commonly developed tests are modifications or extensions of standardized tests; such composites as items from the Humm-Wadsworth test that are most symptomatic of paranoia, from the Bernreuter test that are most indicative of introversion, and from the A-S tests that are most indicative

[1] Adams, C. R., A New Measure of Personality, *Jour. Applied Psychol.*, 25 (No. 2): 141–151, 1941.

of submissiveness, provide the raw material from which a test is constructed that gives the most reliable index of undesirability. On the other hand, the same standardized tests provide the issues for appraising such qualities as self-confidence, normality, and social responsiveness. When such tests are used, they are sequels to ability tests, and are used for the purpose of spotting potential misfits; their use in industry parallels their use in colleges, where academic record and ability promise are the chief criteria for admission and where scores on personality tests, secured after admission, provide indexes of potential maladjustment.

In the second type of situation, personality tests are substitutes for ability tests or are given more weight than are the measures from ability tests. For satisfactory performance of such duties as the responsibilities of foremen and supervisors in industry, salesclerks in department stores, customer service clerks, and field salesmen, personality factors are of more importance than ability factors. To appraise the potential adequacy of candidates for such positions, well-constructed and properly validated personality tests have been found of more value than ability tests. The results from three studies will indicate their possible worth.

1. Lovett and Richardson[1] studied the relation between salesmen's records in the Procter & Gamble Company and their scores on a social intelligence test and parts of the Thurstone Personality Schedule, the Strong Vocational Interest Test, and some A-S tests. The same records were compared with the scores on a mental alertness test. The items that gave the highest correlations with sales records were those relating to personality adjustment, which thereafter were given a weight of 42 in an appraisal battery; those concerned with dominance-submission, with a given weight of 39; those concerned with social attitudes, with a given weight of 36; and those concerned with mental alertness, with a given weight of 18.

2. Similar results were secured from a study made by Wonderlic and Hoveland.[2] They selected 450 items from standardized personality and interest tests, and compared the results, on 200 people who were working in contact positions, with their work records; they then contrasted these results with the records of 500 applicants for similar positions. From the test collection, 139 items were chosen because of a consistent difference between the responses of the successful and the unsuccessful employees. These items were grouped into three classes:

[1] Lovett, R. F., and M. W. Richardson, Selecting Sales Personnel, *Personnel Jour.*, 12: 248–253, 1933–1934.

[2] Reported in Experience with Employment Tests, *Studies in Personnel Policy*, No. 32, pp. 60–61, The Conference Board, New York, 1941.

a. Those concerned with behavior in personal-social relations, *e.g.*, the extent to which candidates participated in athletic and social activities, the manner in which they reacted to competition, and their behavior in different situations.

b. Those concerned with preferences, *e.g.*, working alone *vs.* working with others, reading *vs.* the movies, and athletics *vs.* study.

c. Those concerned with interests; the occupations, amusements, activities, and school subjects of interest to the successful employees differed markedly from those of interest to the unsuccessful.

Because of the consistency of difference of response to these three types of items and the low correlation between these items and scores on a mental alertness test (.04 with the Personnel Test and .08 with the Otis S-A), the 139 items were used as a means of appraising candidates, and have proved their selective value over a 6-year period.

3. One of the most exhaustive studies of the value of personality tests has been reported by the Life Insurance Sales Research Bureau.[1] For some years the L.I.S.R.B. has been attempting to appraise the personality factors that are most significant for life insurance salesmen. The result of a study of the application forms of 11,000 salesmen was the selection of nine items in each of which there was a consistent difference between the successful and unsuccessful men's responses. These nine items form Part I of the Aptitude Index, and include such queries as

What is your approximate net worth?
What are your minimum current living expenses?

The second part of the A.I. is the result of a similar study of the types of response that salesmen give to items that form the contents of representative personality questionnaires; from the responses to a large number and variety of questions a collection of questions was accumulated in which there was a consistently reliable difference between the successful and the unsuccessful salesmen; as a result of these known differences a second part was added to the A.I., which consisted of three parts: 81 questions of the yes-no type; three groups of six items each describing personal characteristics, which are to be arranged in rank order according to the manner in which candidates rate themselves on these characteristics; and 12 items referring to interests and preferences, each with four alternatives, to be arranged in rank order in terms of their appeal to the applicant.

Each item in the two parts of the A.I. is given a weighted value, and the total value of Part I is weighted in relation to the total value of Part II, according to the age of the applicant; for the younger applicants the

[1] KURTZ, A. K., Recent Research in the Selection of Life Insurance Salesmen, *Jour. Applied Psychol.*, 25 (No. 1): 11–17, February, 1941; and *How Well Does the Aptitude Index Work?* p. 74, L.I.S.R.B., Hartford, Conn., 1941.

ratio is 1:1½, while for the older applicants the ratio is 1½:1. The follow-up study of the merits of the A.I. was limited to 1,000 agents who were chosen during 1939 and on whom there were sales records for 1 year. Some of the results were as follows:

a. In the first year of selling, 4 salesmen who were rated as A on the A.I. sold as much insurance as 6 who were rated as B, or 9 who were rated as C, or 13 who were rated as D, or 19 who were rated as E.

b. The sales ratio of the group below age twenty-five, in terms of their A.I. score, was 36:25:16:12:10, and the sales ratio of the group above age twenty-five was 43:29:20:14:9.

c. The chances of selecting a high producer among the A.I. groups were in the ratio of 21:11:4:3:0; and the survival ratio of the different A.I. groups was 5:4:3:2:1.

These results and the technique by means of which the significant elements in standardized questionnaires were derived represent the use to which personality tests may be put. As a means of appraising the personality of applicants, they are a step in advance of the indiscriminate selection of any standardized test that purports to measure hypothetical and nonexistent entities without giving any indication of their importance in the particular hiring situation. Besides, they indicate the procedures by means of which items in personality inventories must be evaluated before their findings are used as selection tools for particular types of work or in particular situations.

The method that is illustrated in these three reports indicates the manner in which personality tests may be of value in the employment office; no employment manager can safely place confidence in the results of a test of introversion or aggressiveness—for example—unless he knows the extent to which the modes of behavior that are indicated by these terms are essential for success in the positions for which he is hiring candidates; and no employment manager knows the extent to which the tool will appraise these qualities until he has discovered the particular parts in the tool in which the successful present employees differ from the unsuccessful ones.

Personality tests are to the employment officer what the stethoscope and blood tests are to the physician; when constructed and standardized in terms of situational demands, they serve as preliminary forms of diagnoses, the readings from which may be interpreted differently in every case in accordance with the subsequently disclosed symptoms. Their purpose is to make the interview meaningful, to aid the candidate the better to understand himself when, under guidance, he is attempting to discover his assets and possible liabilities, and to make as specific as possible the attributes and qualities around which the inquiring interview is centered.

SUMMARY: THE USE OF TESTS TO THE EMPLOYMENT MANAGER

The various tests that have been outlined in this chapter and those previous represent the ones that are in use in employment offices today. They are typical of those being used in approximately one-quarter of the larger industries in the country.[1] It might be well to ask under what conditions their use is justified, what factors should be considered before they are added to established employment technique, and what contribution they may be expected to make.

1. Factors for Consideration.—Some of the factors that should be considered before they are introduced into the employment office are the following:

a. Are the present selection methods satisfactory? The chief criterion of satisfactoriness is the extent to which choices that are made in the employment office meet the demands of departmental heads. These demands may be unreasonable, the standards they represent may be in terms of unjustifiable whims, and they may have no relation to future capacities or needs. However, a primary consideration in the employment office is the supply of adequate assistance to departments. The extent to which the selections meet the standards and expectations of supervisors determines the confidence that will be placed in selection tools. Only when supervisors are convinced that the addition of tests to the usual selection methods helps reduce labor turnover and secure employees who absorb job demands in a reasonable time will their support be given to the findings of the tests.

b. Will adequate provision be made for test experimentation and administration? Tests are new tools; their value will be known only when they have been tried out under competent direction for a sufficiently long time to appraise their worth in terms of job demands. For at least a year, and frequently for much longer, after they are introduced they have no value; until they are validated in terms of production norms, job requirements, and reliable employee records, their disclosures have no meaning. For a testing program to be effective its use must be preceded, in every case, in every company, by a considerable outlay on the part of experiment minded management.

c. Will they add sufficient information about candidates to aid the employment office in making a better choice? They will undoubtedly give the general mental level of candidates, the trainability of candidates, and the latent skills or appraisals of acquired special knowledge in the possession of candidates. But to what extent and at what level are these discoveries of importance on the job? In other words, the possible value of tests is reduced, and probably negated, unless the job demands are known and are translated into levels of ability.

d. Will their limitations be recognized? Tests are not cure-alls; at their best they will miss the mark in 10 per cent of the selections. Their findings give no guarantee of satisfactory performance; they indicate promise. The extent to which that promise is translated into action depends upon factors that are beyond the control of the employment office; unless these limitations are realized, the possible value of tests

[1] Scott reports that 20 per cent of the companies surveyed in 1940 were using psychological tests, against 17 per cent in a similar survey in 1930. See SCOTT, W. D., R. C. CLOTHIER, S. B. MATHEWSON and W. R. SPRIEGEL, *Personnel Management*, 3d ed., p. 522, McGraw-Hill Book Company, Inc., New York, 1941.

will be discounted because of the inevitable occasional case that does not run true to form.

These are among the preliminary considerations that should precede test adoption. Failure to give them proper weight results in hasty discard of a tool that could be of value if it had been given a proper start.

2. Errors and Resulting Dangers.—A résumé of the most frequently occurring errors in introducing tests will serve to indicate the dangers that may arise from a hasty adoption of them.

a. Seeking a brief test that can easily be administered in a 15- to 30-minute period, and preferably self-administering (to avoid the supplementary expense and space that proper administration necessitates), and expecting the results to provide significant information. The craze for short cuts has long since been eliminated from the engineering laboratory but lives on in the employment office. Unless adequate space and help are provided to the employment manager, and an appropriation that is at least the equal of that provided for the administration and interpretation of medical tests is made, the adoption of tests is likely to be detrimental to the welfare of the organization as well as against the best interests of candidates.

b. Selecting standardized tests because of reports of their validity in other situations. The variations in jobs that go by the same name have for a long time been the bane of job analysts; no one has succeeded in formulating job specifications of general value for even such simple jobs as typing and filing. Jobs vary from company to company; the specification that is appropriate in one company is modified in another because of variations in demand and in the supplementary and yet essential tasks that go with the base task. The adequacy of a test is in direct ratio to the validity, with which it appraises the key demands of the tasks in a total job. Until these are known and are translated into measurable quantities, the results from any test give little more than an index of the general state of alertness or inertness of the candidate.

c. Ignoring the limitations of tests. Under the most favorable circumstances the results from any test or from any battery of tests give an indication of what a candidate *can* do; and even when an extensive battery is used it does not appraise all the capacities of a candidate. It gives no indication of what a person *will* do; it gives no estimate of many of the crucial factors that make for job success; and in its estimate of factors that it appraises, its index has a variance of between 8 and 15 per cent.

3. Value to Management.—Of what value, then, are tests to the employment manager? Assuming that they have been properly constructed and have been validated in terms of job demands, they can be used as supplements to or replacements of the customary employment tools in the following ways:

a. They can indicate the major fields of interest along which the applicant's enthusiasms will be likely to develop, and so signify the major divisions of work in which he will probably be most successful. The applicant's statement that his preferences are in one of the three common major fields—production, contact, and office—is no guarantee that his announcement harmonizes with his dominant interest pattern.

b. They can be used to indicate the general level of promise of the candidate, and thus signify the job level that he is capable of reaching and for which he may be

trained; thus they provide a measure of the amount of outlay that management may provide for his development.

c. They help make an approximately accurate measure of the extent to which the applicant's abilities and achievements measure up to the demands of the job. This value is known only when the demands of the job are known and when reliable tests are validated in terms of these demands.

d. They help discover the handicaps of the candidate; for positions that require a high level of motor coordination, sustained discrimination, computational accuracy, clear expression of logical sequences, and judgment in specific situations, the results from properly validated tests are of more value than those from any other tool in the employment office.

e. They can be used to act as a check on reported experience. One of the most frequently occurring problems in the employment office is the task of appraising the promise of candidates who report definite experience at specific types of work; some check on the value of that experience must be made. The most speedy and reliable check is gained by means of trade tests that relate to job demands.

f. They serve as a means of making objective comparisons. Normally there are at least eight applicants for every position; unless there are specific measures for comparing each applicant's promise, no accurate estimate can be made of the relative merits of the candidates.

g. They aid in setting employment procedure standards that are binding on the interviewer and that command the respect of the deserving and the fear of the slothful.

Topics for Report

1. What theory of personality is assumed by the following tests: the Bernreuter Inventory, the Thurstone Personality Schedule, the Humm-Wadsworth Temperament Test? What aspects of personality are ignored by each of these tests?

2. If personality were to be interpreted as the sum total of one's habit patterns, what patterns would be included under the following: economic values, social behavior, attitude toward law and order, aesthetic appreciation?

3. It is assumed in this chapter that personality demands vary in different situations; what differences are there in such demands from high school students, business school students, liberal arts college students?

Required Readings

1. ALLPORT, G. W.: *Personality, A Psychological Interpretation*, pp. 286–365, 448–485, Henry Holt and Company, Inc., New York, 1937.
2. MOORE, H.: in Experience with Employment Tests, pp. 29–37, 58–60. *Studies in Personnel Policy*, No. 32, The Conference Board, New York, 1941.

Supplementary Readings

1. LOCKHART, E. G.: *Improving Your Personality*, Walton Publishing Company, Chicago, 1939.
2. HEPNER, H. W.: *Psychology Applied to Life and Work*, pp. 51–145, Prentice-Hall, Inc., New York, 1941.
3. SYMONDS, P. M.: *Diagnosing Personality and Conduct*, pp. 503–530, D. Appleton-Century Company, Inc., New York, 1931.

CHAPTER VIII

APPRAISING THE EMPLOYEE

WHY APPRAISALS ARE NECESSARY

The appraisal procedures through which the applicant has passed in the employment office are continued in somewhat different form during much of his employment period. Problems of a rather different nature confront management, and techniques for solving them necessarily vary. Among the issues with which management is confronted are such as these: How well will the employee live up to the promise that the employment office has indicated? What are his chances of assuming responsible duties? What supervisory promise has he? What attitude is he developing toward those with whom he works and toward the company as a whole? In what ways is he becoming a problem to management?

The answer to some of these problems is obtained by means of supervisors' reports, but these reports are subject to the various forces that warp human judgment—the extent to which the employee inflates or deflates the ego of the superior, idiosyncrasies that are among the pet peeves of the supervisor, and resemblances to previous acquaintances. Because of these influencing factors, the making of accurate and just estimates is impossible unless the reports are in terms of objective standards and specific issues that act as guides to the supervisor. The most widely used aid in making these reports is the rating scale.[1] The types that are in use, with the pitfalls to which they lend themselves, and the types that give most promise of adequate returns will be described and illustrated.

TYPES OF RATING SCALES

There are two general classes into which present rating scales may be grouped: (1) ranking scales and (2) scoring scales.

Ranking Scales.—These usually ask for a grading of people or traits in some specified order, usually from best to worst. They are commonly used among members who know one another well, or for the purpose of measuring an individual's attitude toward an issue. They were used

[1] Scott reports that 52 per cent of the 231 companies that replied to his 1940 questionnaire were using rating scales, against 41 per cent in the 1930 survey. See Scott, W. D., R. C. Clothier, S. B. Mathewson, and W. R. Spriegel, *Personnel Management*, p. 534, McGraw-Hill Book Company, Inc., New York, 1941.

originally by Cattell[1] as a means of selecting his candidates for *American Men of Science*, *American Psychologists*, etc. More recently they have been used by Thurstone in his attempts to devise scales for measuring public attitudes toward public issues, *e.g.*, prohibition, blue laws. The merits of these scales are their concreteness and definiteness, their avoidance of immediate emotional reactions, and their not being subject to the "halo" effect. Their weakness lies in the difficulty of placing any group of people in rank order in any type of situation. It is nearly impossible to give rank position to the members of a college class, despite the records of quizzes, term papers, and conferences; it is much more difficult to place people in rank order when much less is known about them.

Scoring Scales.—These scales demand the use of judgments which place an individual or a trait on a scale of already defined steps, and are used when a single individual or trait is to be rated, or when ratings of a group are desired and each rater knows only a section of the number to be rated. They are usually divided into two types with two or three versions of each type. The classification in Table 52 comprises those most frequently used.

Table 52.—Types of Rating Scales

Scoring scales	
Simple	Weighted
1. Paired comparisons	1. Point
2. Questionnaire	2. Frequency
3. Multiple reaction	3. Graphic

Simple Scoring Scales

In the simple scoring scales there are a number of items, each of which has two or more defined or illustrated grades, one of them to be selected as characterizing the person. The three methods are as follows:

1. Paired Comparisons Method.—In this type of scale there is commonly a list of contrasting pairs, each one of which is to be checked by the rater. It was popularized by Thurstone in his study of social values,[2] and is regularly used by the National Institute of Industrial Psychology in their vocational guidance program. In their attempts to form an estimate of the character qualities of the candidate, they provide parents, teachers (or others who have been directing the candidate), and the candidate himself with a list of contrasting qualities, requesting that the one member of each pair which most often characterizes the subject

[1] Cattell, J. M., Statistics of American Psychologists, *Amer. Jour. Psychol.*, 14: 310–328, 1903.

[2] Thurstone, L. L., The Method of Paired Comparisons for Social Values, *The Journal of Abnormal and Social Psychology*, 21: 384–400, 1927.

be underlined, and that a question mark be placed between those contrasts about which the rater is in doubt. The amount of agreement or disagreement among the different judges gives an indication of the presence or absence of the quality in the candidate. Illustrations of such pairs are

Sociable	Unsociable
Talkative	Quiet
Frank	Reserved
Pushing	Retiring
Confident	Anxious, etc.

The advantage in the use of such a form is the opportunity it gives the subject to form an estimate of his own characteristics, and to contrast his judgment with that of others. The eagerness with which candidates seek for parents' and teachers' judgments of their qualities is an index of the interest the technique arouses. Its value is problematical; in my experience with over 300 vocational guidance cases, the value varies in proportion to the judge's capacity for being objective and impartial. It is rare to find fathers who will do justice to their sons by granting them the qualities every other judge ascribes to them, and equally rare to get mothers to give paper judgments of their daughters ascribing to them the undesirable traits that every other judge believes they possess. It is also difficult to score the results; at best, any scoring system is a subjective estimate and of very little value. The chief value of such systems lies in providing definite points for discussion in an interview and giving tangible issues in relation to which remedial measures may be suggested.

2. The Questionnaire Method.—In a hit-and-miss fashion this method is as old as time, but it was systematized during the First World War by Woodworth with his famous P.D. Scale,[1] and has since then been adopted by a number of organizations and adapted to a great variety of situations. In devising the scale, Woodworth had as his objective the discovery of those army recruits who would not likely be able to stand the strain of war conditions. He assembled about 200 questions, taken from authorities in psychiatry and dealing with symptoms found generally to antedate nervous and mental breakdowns. These he submitted to groups of college students and to nearly 1,000 drafted men, as well as to a number of men who had already been diagnosed as psychoneurotic. He set up two criteria that individual questions had to meet before being included in the final form of the scale: (*a*) All questions that returned more than 25 per cent of unfavorable answers among the

[1] See Franz, S. I., *Handbook of Mental Examination Methods*, pp. 170–176, The Macmillan Company, New York, 1920, for the complete scale.

"normal" group were eliminated or stiffened, on the ground that a symptom that appeared so frequently among normal people could not be indicative of abnormality; (*b*) a "symptom" had to be reported twice as often by neurotics as by normals to be taken as indicative of abnormality. This is what is generally known as the empirical method of selecting items. Another method, occasionally used, is to make a careful analysis of the field being measured and, on the basis of the results, assemble a number of questions. That method has been used by Heidbreder and Freyd, for example, in the construction of their scales of introversion-extroversion.

The questionnaire usually takes one of two forms—true-false or yes-no; sometimes there is a third alternative, either in the form of a ? or "mid-ground" answer. Examples of the different types will illustrate their nature:

Do you often feel just miserable?	Yes		No
Are you ever sorry for what you do?	Yes		No
I brush my teeth daily	True		False
Is he neat in his paper work?	Yes		No
Does he resent correction?	Yes	Sometimes	No

In each case the *correct* answer is to be underlined. The form may be completed either by the candidate or by another person in the interests of the candidate.

An interesting variation of this form of rating has been introduced in the Pittsburgh Division of the Westinghouse Electric and Manufacturing Company.[1] Objecting to current rating scales because they attempt to break down an individual into component attributes—a thing that cannot be done, and on which, if it were done, no two raters would agree—and to measure abstract qualities, which become a source of endless argument and discussion, they propose to eliminate analysis, to treat the man as a whole, and to measure the usefulness of his acts. But acts vary with type of work, and, accordingly, the questions asked vary with the type of work normally performed by the person. Work at Westinghouse is divided into seven position groups—unskilled, skilled, interpretative, creative, executive, administrative, and policy—and a separate set of questions has been devised for each group. The following directions and questions for the "interpretative" group will represent the form the questionnaire takes.

Directions: The employees whose names appear on the opposite page all occupy positions that are similar or sufficiently so to fall in the same general group.

Certain action and performance that are recognized as expected and of merit in positions in this group are suggested in the following questions. These questions

[1] Quoted by permission of the Westinghouse Electric and Manufacturing Company, Pittsburgh, from an *Industrial Relations Manual*, Sec. 1, July, 1937.

need not be regarded as an exclusive rating scale; the addition of other performance measures suggested by your own experience and knowledge of the work these employees are called upon to do is desired, and space is provided for them.

Does he respect confidence?
Does he classify his work accurately?
Does he set a good example in conduct, appearance, and attitude?
Does he recognize what is beyond his scope?
Does he refrain from assuming too much authority?
Does he carry through?
Does he recognize conditions that need improving?
Does he secure cordial response from those under his authority?

Your method of scoring may conform to your own best practice. One way you may find effective is to go down the list of questions asking yourself each with respect to him you are rating. On a scratch pad, make a "tip" if there is nothing very positive to say, or if the question does not apply; a " + " if high; and a " − " sign if low. No effort need be made to mechanically total these symbols—simply use them as part of your judgment-forming process. . . . Then number the person you are rating in the order of performance—the outstanding man within the group is given a one (1); the next, a two (2); etc., to the weakest and least mature in relation to the demands of the position.

Appropriate remarks may be recorded. It goes without saying that the results should express an impartial and accurate estimate. Anonymous comments such as "I have heard it said . . . . " or "Those who know him best . . . " destroy the value of the score. Reasons for low scores are desirable. Preferably copies of the scores should not be made, but if they are, they should be personally retained by the scorer for his own further reference.

Score sheets should be dated and initialed, and may contain notation of any who have been consulted, if based on direct observation or report.

Position	Names	Rating	Remarks
	____________________	☐	
	____________________ etc.	☐	

Regarding the value and use of this method Mr. W. G. Marshall, vice-president says:

The Westinghouse plan drives to the heart of the problem by measuring ends and results instead of means and methods. The plan puts a premium on action. Only portions of the organization are rated in any year, though the concentration of effort at any particular time is on group levels rather than on departments. An amount of performance rating work sufficiently small in volume, not to become burdensome, going on in a department continuously is of more organization value than a concerted drive to rate everybody and give everybody a score.[1]

The plan is used for three purposes: (*a*) to establish relative quality of performance or action, (*b*) to record relative merit as an index of assistance to executives making assignments and appointments, (*c*) to

[1] *Op. cit.*, p. 9.

measure the degree in which individuals meet specifications considered as necessary or desirable in the level of work in which they are engaged. With the accomplishment of these purposes, "the larger objective of serving both company and employees through the discovery and recognition of capacity and ability will be achieved to the lasting benefit of organization and individual."

3. Multiple-reaction Scales.—These scales are primarily a form of questionnaire in which there is a statement concerning an issue or situation, and which offers a number of alternative solutions one of which is to be checked. Its form has been popularized by the Allports in their reaction test, and has been used by a number of other research workers.[1] Its widest application has been in achievement testing, but there is an interesting variation in the use made of it by Pressy in his X-0 tests, in which it appears in the following form:

Directions: Read through the twenty-five lists below and cross out everything about which you have ever worried, or felt nervous or anxious. You may cross out as many or as few words as you like; there may be some lines in which you do not wish to cross out any. But be sure you cross out everything about which you have ever worried.

1. Loneliness, work, forgetfulness, school, blues;
2. Sin, headache, fault-finding, sneer, depression;
3. Meanness, clothes, sickness, looks, unfairness;
4. Discouragement, self-consciousness, failure, accidents, worry;
5. Temper, disease, pain, money, awkwardness, etc.

The number of words crossed out is indicative of the strength of whatever tendency is being measured, be it emotionality, melancholia, or any attitude or belief.

This form of test is interesting to the subject, and probably has some diagnostic value; it is difficult to construct and to those of limited intelligence confusing to take. Because this is so, it has been rarely used in industry. Such tests may serve as a convenient research tool, in a manner similar to the use made of the technique by Chambers[2] as a means of discovering the words typically underlined or crossed out by the reliable and steady workers in contrast with those crossed out by the floater—but their value in estimating the promise of an employee is questionable.

Weighted Scoring Scales

In the case of weighted scoring scales, each item is given a definite numerical value based on an arbitrarily chosen unit or range, or on a

[1] See, for example, RAUBENHEIMER, A. S., An Experimental Study of Some Behavior Traits of the Potentially Delinquent Boy, *Psychol. Rev., Mon. Supp.*, Vol. 34, 1925.

[2] CHAMBERS, O. R., Character Traits and the Prognosis of College Achievements, *Jour. Abn. Soc. Psychol.*, 20: 303–311, 1925.

statistically weighted value. The total score in each case is the sum of the values belonging to the checked items. Descriptions of the most commonly used types are given here.

1. Point Scales.—These scales consist of a number of items to each one of which there is given an arbitrary value, usually ranging from the highest, for the best solution of the situation, to the lowest, for the poorest. One of the earliest forms of this type of scale was the *man-to-man* scale, originally developed at the Carnegie Institute of Technology by Dr. W. D. Scott for the purpose of selecting salesmen, and later adapted to the Army demands in selecting officers. Since then it has been used in a variety of forms for numberless situations. The original method was similar to Cattell's; *i.e.*, out of a group of men, the best was selected for the top, the worst for the bottom, and the average for the middle, and a score value was given for each group. The qualities regarded as necessary for success in the position were defined, and each quality was given a range of values; for example, the important qualities that it was thought an Army officer should possess were physical qualities, intelligence, leadership, personal qualities, and general value to the service. Leadership was interpreted as the possession of initiative, force, self-reliance, decisiveness, tact, ability to inspire men and to command their obedience, loyalty, and cooperation. The candidates were placed in five groups on each quality: the highest, 15; high, 12; middle, 9; low, 6; and lowest, 3; and the total of a candidate's score on all five qualities helped to decide his rank.

An interesting variation of this form is in use by the Personnel Research Department of the Procter & Gamble Company,[1] for the estimating of their salesmen. In order to keep the scale factual, the authors collected over 1,000 statements from supervisors, managers, and trainers, which described the performance of men on the job. These statements were then edited, and those which were ambiguous, or which gave two ideas in one sentence, or which duplicated other statements were eliminated; thus the number was reduced to 531. Fourteen judges were then asked to separate the statements into seven piles, representing seven "equally spaced degrees of effectiveness on the job." Only those statements were accepted in which there was close agreement by all the judges; thus the original number was reduced to 132. These were then divided into two supposedly equal forms, which were filled out on 650 salesmen by from two to five supervisors. Because of the overlapping of ideas in some of the statements, 30 of the 132 were eliminated, and the remaining 102 divided into two groups of 51 each. At the beginning of one month 305 men were rated on one form, and at the beginning of the

[1] Richardson, W. M., and G. F. Kuder, Making a Rating Scale That Measures, *Personnel Jour.*, 12: 36–40, 1933.

next month they were rated on the other form. Correlation between the two was .90; the correlation between the ratings of two different judges was .83. Each item on the scale was given a weighted value, which was the average of the placements in the separate piles, the separate piles ranging in value from 10 to 70. The following selection illustrates its nature:

Directions: Below are a number of statements that have actually been made about Procter and Gamble case goods salesmen. Read each statement, and put a plus (+) sign before it if it applies to this man. Put a minus (−) sign if it does not apply. Use a question mark (?) if you are not sure.

	Scale value[1]
____He is somewhat in a rut on some of his brand talks	32
____He tends to keep comfortably ahead of his work schedule	56
____He is a good steady worker	46
____He is weak on planning	29
____He is making exceptional progress	69

[1] The scale values were not placed on the form given to the supervisors, none of whom knew the plus or minus value of any item they checked.

Regarding its value, Richardson and Kuder say:

The scale as finally developed has the merit of being easy to fill out and easy to score. It is capable of annual revision without destroying the comparability of periodic scores. The consistency of individual rates is easily checked in the personnel office. It is possible, by these techniques or improvements upon them, to develop a rating scale of higher reliability than those usually used in industrial personnel work. Such a scale must be developed to meet each industrial situation.[1]

Another interesting form in which this type of scale appears is that used by J. B. Probst.[2] He set out to develop a scale that would avoid the usual objections to those in common use—such as the halo effect, the use of abstract terms, the inconsistency between different ratings at different times, and the differences between rating reports and other estimates of the employee—and to develop a system that would meet the following conditions:

a. The employee's performance must be reported not merely in general conclusions out in statements of fact or specific and verifiable judgments.

b. The facts, traits, or qualities must be stated on the report form in terms of everyday thinking of the reporting officer, not in letters or percentages.

[1] *Op. cit.*, pp. 39–40.

[2] Probst, J. B., *Service Bulletin*, Technical Bull. 4, Bureau of Public Personnel Administration, Chicago, 1934. See also *The News Bulletin* issued occasionally by the Probst Rating System, 1843 Ashland Avenue, St. Paul, Minn., and The Probst Employee Rating Plan, *Personnel*, 8: 21–24, 1931.

The reported facts must be properly interpreted and evaluated by a process which, in the very nature of things, must be developed through extensive experiments based on thoroughly sound principles.

d. The report sheet must permit the officer an optional selection of various traits and qualities, so that he may report on only those things with respect to which he has definite knowledge.

e. The reporting officer must not be required to measure relative degrees of a quality in different employees.

f. The rating and scoring system must make it unnecessary to adjust the resulting scores or ratings.

g. The reporting officer must be virtually forced to report accurately, or be shown by internal evidence in his own reports not to have done so.

h. The results of the scoring system must be sufficiently simple for the employees to understand, so that they themselves may easily determine in a general way the fairness and reliability of the distribution of ratings.

i. The scheme must also take into consideration the ordinary mental processes of the reporting officer—his reluctance generally to rate negative qualities, his normal desire to say good things about an employee, his tendency to use superlatives in describing the favorite employee, and the like.

The result of this ambitious set of conditions was the development of a number of "service reports," each of which contains about 100 descriptive items concerned with character traits, habits, work qualities, and personality. All the items are of outstanding traits, and have been selected "through scientific research and a process of individual experimental testing and research." The manner in which the report appears is illustrated in the following form, an extended form of which is used in appraising the service value of unskilled and semiskilled labor:

Name of employee________J. J. Jones.________Title________
District, division or station________

Directions: On this form you are to report the service value of the employee mentioned above. The report should be for the six-month period shown hereon, unless otherwise indicated.

In addition to the blanks to be filled in below (here labelled *A*) you should check (with an *x*) all those items in (column *B*) that you can find which will properly fit or describe this employee. Do not guess; if you are not reasonably sure that the employee possesses the trait or quality indicated by a certain item, do not check that item at all. It is not necessary to check any given number of items. You may be able to check 25 or more for one employee and have difficulty in finding more than a dozen or so to describe properly some other employees. Make your *x*'s small; keep them inside the little squares (on the lines, in this report). Do not change the wording of any item.

This sheet should be checked, whenever possible, by three foremen or other supervisory officers. Each should select one of the three check columns in which to make his x marks. The foreman or supervisor who is lowest in rank should be the first to check the sheet; then the next higher (or equal) in rank should check; and the one in highest authority should check last.

Foremen may add on the other side of this sheet additional items of their own to further describe this employee.

Column A. How many days was this employee absent during this period? (Do not include absence for injury in line of duty or absence on regular vacation.)

a. For sickness, with pay .... ____days
b. For sickness, without pay .... ____days
c. For personal reasons, with or without pay .... ____days
d. How many times absent without leave .... ____times
e. (If there was any other absence, or any suspension; or loss of vacation, bonus, merits; or any other penalty, explain briefly here)________________

Check only one item in each of the following boxes. Consider not only the punctuality of the employee in reporting for work, but also his promptness in answering calls and doing specially assigned work.

Check
Columns
1 2 3

__ __ __ Nearly always late
__ __ __ Usually late
__ __ __ Often late (about half the time)
__ __ __ Usually punctual
__ __ __ Never, or hardly ever, late

__ __ __ Nearly always quits ahead of time
__ __ __ Usually quits ahead of time
__ __ __ Often quits ahead of time
__ __ __ Watches clock too much near quitting time
__ __ __ Seldom quits ahead of time
__ __ __ Never quits ahead of time

Column B

Place an x mark next to each of the items in this column which you know from your own experience will describe or fit this person.

Check
Columns
1 2 3

__ __ __ Lazy
__ __ __ Slow moving
__ __ __ Quick and active
__ __ __ Too old for the work
__ __ __ Minor physical defects
__ __ __ Serious physical defects
__ __ __ Indifferent; not interested
__ __ __ Talks too much
__ __ __ Too blunt or outspoken
__ __ __ Too much self-importance
__ __ __ Good team worker
__ __ __ Not a good team worker

— — — Resents criticisms or suggestions
— — — Antagonizes when dealing with others
— — — Might often be more considerate
— — — Usually pleasant and cheerful
— — — Always[1] obliging

[1] Always means "with rare exceptions."

Column C

In the following spaces you may add such other items of your own as you believe will further describe this employee.

— — — ____________________
— — — ____________________
— — — ____________________

REMARKS

____
____
____

Identification key to reporting officer		
Column I	Column 2	Column 3

By means of a formula Probst translates the raw checks into proper letter ratings, from A+ to E– in 11 steps. He gives the distribution of ratings on one of his reports,[1] a study of 3,039 employees of the Los Angeles Water and Power Department, as follows: A, 4.8 per cent; B+, 5.2 per cent; B, 12 per cent; C+, 22 per cent; C, 23 per cent; C–, 11.5 per cent; D, 12 per cent; D–, 7 per cent; E, 4 per cent; E–, 1 per cent. In the same study Probst reports a reliability coefficient of .78, using the ratings of 475 employees who were rated again 6 months after the first rating.

The Probst Rating System has been in use in a number of cities and industrial organizations. Its value is given by C. A. Dykstra, formerly the city manager of Cincinnati, as follows:

Constant studies are being made of all new service rating systems as they come out, but up to this time none has been found more satisfactory than the Probst system, which has been used by the city for five years. Both skilled and unskilled employees are rated regularly, and these records are valuable in maintaining personnel standards. Reports during the year totaled 8,789.[2]

[1] PROBST, *Personnel*, 8: 22, 1931.
[2] *Municipal Activities in Cincinnati*, 1935, a report from the city manager, C. A. Dykstra.

2. Frequency Scales.—In these scales the trait studied is regarded as being distributed in the normal population according to the frequencies of the normal distribution curve. Each trait is divided on this basis into from 5 to 10 units, equal intervals on the scale representing equal steps in frequency on the normal curve. The subjects to be rated are then assigned to positions most descriptive of their behavior. Degrees on the scale are expressed in terms of per cents or point values. An explanation is usually given regarding the normal expectancy of distribution; about 7 per cent falling in each of the extreme groups, 24 per cent in each of the above- and below-average groups, and 38 per cent in the average group, or in some such suggested distribution. An illustration of this scale is the one devised by Seashore[1] to estimate students' capacity to do graduate study. In this scale he lists 10 qualities: reasoning power, originality, memory, accuracy, application, alertness, cooperation, moral attitudes, health, zeal for investigation. Each of these traits is defined, and the rater is asked to check the level to which the candidate belongs in each trait. One illustration is given:

	A	B	C	C−	D	E
Alertness: Quick, incisive, and responsive observation, thought, and feeling.	10%	20%	20%	20%	20%	10%

The weaknesses of this type of scale are implicit in the criticisms given by those responsible for the type used by Procter & Gamble, Westinghouse, and Probst—the use of abstract terms, the "halo" effect, and the analysis of a capacity into hypothetical elements which vary from analyst to analyst. Equally significant is the important part played by the judge in such a scale, in which nothing specifically definite is used as a guide to the formation of his judgments. Selecting the judge, or rater, is all-important if this type of scale is to have any value. What his qualifications should be have been listed by G. W. Allport[2] as follows: (*a*) experience, particularly in the type of work on which he makes a judgment of others; (*b*) some degree of similarity to the person whom he is attempting to judge—"The best judges of a trait in another person are those who possess the trait to a high degree";[3] (*c*) intelligence; high intelligence characterizes good raters, but raters who are well acquainted with the candidate's experience can to some extent be a substitute for exceptional intelligence; (*d*) insight; the rater must know himself—"be able to disentangle his own knots"—before being able to unravel those of others; (*e*) complexity; we understand best those who are simpler than ourselves; those more subtle or complex,

[1] Published by C. E. Seashore, Extension Division, University of Iowa, Iowa City.

[2] Allport, G. W., *Personality*, pp. 513–516, Henry Holt and Co., Inc., New York, 1937.

[3] *Ibid.*, p. 514.

the relatively simple cannot comprehend; (*f*) detachment; the best judges are not too much preoccupied with social values; casualness characterizes them; (*g*) the aesthetic attitude, which enables him to comprehend "the intrinsic harmony of any object that is the center of attention"; (*h*) social intelligence—this is not an essential trait, except in the judgment of behavioral patterns; for interpretations of attitudes it is of minor value.

To expect these qualities in all judges of all kinds of rating scales would limit their use and prohibit the exercising of judgments; the necessity for them is apparent in the "subjective" type of rating scale; on the other hand, when the rater is dealing with activities, rather than with abstractions, familiarity with the ratee and an absolutely objective, impersonal attitude are essential.

3. Graphic Rating Scales.—In these scales the quality, ability, or habit to be rated is defined, and several degrees of the trait are briefly described at several points in a 4- or 5-inch line. The rater is asked to check the point on the line that most closely corresponds with his interpretation of the ratee's possession of the trait. The line permits the rater to place his check mark immediately over the description or at any point between any two descriptions. In its simplest form it may appear as a single question with a number of graded answers, *e.g.*,

Health—Is he generally healthy and vigorous?

Bad	Poor	Average	Good	Excellent

and in a slightly extended form it may be of the type used about 15 years ago in the Aetna Affiliated Insurance Companies. Miss Bills[1] divided

TABLE 53.—QUALITIES OF OFFICE WORKERS AND WEIGHTS GIVEN TO EACH

Quality	Weight for type of work	
	Individual	Supervisory
1. Appearance	10	10
2. Ability to learn	20	20
3. Accuracy	25	10
4. Dependability	10	10
5. Speed	20	5
6. Cooperativeness	7.5	10
7. Constructive thinking	7.5	10
8. Ability to direct the work of others	0	25

[1] BILLS, MARION, A., A Method for Classifying Jobs and Rating the Efficiency of Clerical Workers, *Jour. Personnel Res.*, 1: 384–393, 1923.

the necessary qualities of office workers into eight groups—appearance, ability to learn, accuracy, dependability, speed, cooperativeness, constructive thinking, and ability to direct the work of others—then gave a brief description of each quality, and assigned to each a weight, which varied according to whether the employee did regular or supervisory office work. Two of her qualities were defined thus:

III. Accuracy—consider quality of work, freedom from error

No errors	Very careful	Few errors	Careless	Many errors

VI. Cooperativeness—consider ability to work with others

Cooperative	Falls in line	Difficult to handle	Obstructive

The weights given to each were arbitrarily chosen, and varied with what were regarded as the demands placed on the two types of workers. Table 53 gives the weights assigned to each trait.

This method of grading and weighting was significant in that it was one of the earliest attempts to recognize the varying degrees of importance of different qualities, once a task has been analyzed into a number of elements.

A more elaborate and detailed form of rating scale for clerical workers was developed by L. J. O'Rourke[1] at about the same time that Miss Bills had developed hers. Inasmuch as this test represents one of the most complete of the earlier forms of this type of scale, it is being given in full in Fig. 7 on page 188. It was preceded by the following directions:

It is requested that you indicate by check (√) your opinion of the applicant in each of the qualities specified. Place only one check after each quality. . . . In giving your opinion on a particular trait, disregard for the moment every other trait but that one, as specifically defined, and consider the applicant's ability in this trait from the point of view of *general clerical* work only.

A modification of and improvement on this type of scale is that suggested by the American Council on Education,[2] in which five traits are selected for rating: appearance and manners, ambition, leadership, emotional control, and purposiveness. The traits are given in question form, and from six to eight alternate answers are given to each question, from which the rater selects one and gives instances in proof of his selection. Two instances will illustrate the type.

[1] O'Rourke, L. J., and H. A. Filer, Progress in Civil Service Tests, *Jour. Personnel Res.*, 1: 484–520, 1923.

[2] See *Arch. Psychol.*, No. 119, pp. 46–47, 1930.

a. *Ability to learn.* Consider ease and rapidity of understanding new instructions and adapting new situations.	Dull and unadaptable	Learns and adapts slowly	Average learning and adapting	Learns and adapts readily	Learns with exceptional ease and rapidity
b. *Industry.* Consider energy and application to duties day in and day out.	Lazy	Indifferent	Average application	Industrious	Unusually energetic
c. *Initiative.* Consider ability to go ahead with work without being told every detail, and to make practical suggestions for doing work in a better way.	Needs constant direction	No originality	Minor constructive ability	Considerable constructive ability	Highly constructive
d. *Cooperativeness.* Consider ability to maintain good working relations with co-workers.	Trouble maker	Causes slight friction	Indifferent	Cooperative	Exceptionally cooperative
e. *Attitude toward work.* Consider voluntary interest and effort in work.	Unconcerned and no voluntary effort	Interest and effort below average	Average interest and effort	Interest and effort above average	Shows keen interest and whole-hearted effort
f. *Speed.* Consider rate at which applicant is able to work.	Very slow	Slow	Average rate	Fast	Exceptionally rapid
g. *Accuracy.* Consider ability to do work without errors.	Unsatisfactory	Makes many errors	Average accuracy	Seldom makes errors	Exceptionally accurate
h. *Disposition.* Consider natural temper of mind.	Decidedly ill-natured; uncivil	Easily vexed; moody	Average self-restraint	Rarely vexed	Exceptional self-control
i. *Neatness.* Consider orderliness in work.	Disorderly	Somewhat below average in orderliness	Average orderliness	Somewhat above average in orderliness	Exceptionally orderly
j. *Ability to supervise.* Consider ability to direct work of others effectively.	Unable to direct work of others	Somewhat below average ability in directing others	Shows average ability in directing others	Somewhat above average ability in directing others	Maintains loyal and effective work force

Fig. 7.—Rating scale for clerical workers. (*After O'Rourke.*)

A. How are you and others affected by his appearance and manners?	( ) Sought by others ( ) Well liked by others ( ) Liked by others ( ) Tolerated by others ( ) Avoided by others ( ) Don't know	Instances to support your judgment
C. Does he get others to do what he wishes?	( ) Displays marked ability to lead his fellows; make things go ( ) Sometimes leads in important affairs ( ) Sometimes leads in minor affairs ( ) Lets others take lead ( ) Probably unable to lead his fellows ( ) No opportunity to observe	Instances to support your judgment

Variations of Graphic Scales.—A variation of this type of scale is given in the form for rating supervisors suggested by A. S. Knowles.[1] Working on the assumption that rating scales "attempt to measure the presence or absence in individuals of the characteristics which are essential to meet the job requirements set forth in the job specifications," he endeavors to enumerate the job requirements of the usual supervisory task, and then rephrases and regroups these requirements and translates them into terminology "that will cause the rater to think of the factors in terms of the capacity of an individual to meet them." The factors that should be considered in developing job specifications for supervisors are given as skill and experience, educational development and intelligence needed, responsibility, physical effort needed, personality factors required, leadership qualities needed, teaching abilities required, personal productivity, productivity required of unit for which he is responsible, personal efficiency demanded, efficiency demanded of unit for which he is responsible, and special requisites such as age limitations, citizenship, special language abilities, etc. From a summary of the results of such job studies he has translated the responsibilities into three groups of four factors each (see Fig. 8) and asks the raters, not only to judge the foreman as belonging to one of five groups—superior to unsatisfactory—in each of the 12 factors, but also to judge "the relative significance of each trait" and assign a weight to each item in terms of its essentialness (4), desirability (3), or unimportance (2). By multiplying the point value of each rating by its assigned weight, a total score is reached.

[1] Knowles, Asa S., Merit Rating of Supervisors, Foremen, and Department Heads, *Personnel*, Vol. 17, No. 2, 1940.

	1					2	3	4	5
	Superior	Above Aver.	Average	Below Aver.	Unsatis.	Remarks	Weight	Point Rating (R×W)	Review
I. Personality: (a) Appearance Consider dress, manner, physique, neatness, voice.									
(b) Ability to get along with others Consider courtesy and tact, temperament and self-control.									
(c) Character Consider dependability, sincerity, courage and consideration for others.									
(d) Intelligence Consider ability to learn, mental alertness, judgment, imagination, flexibility in handling new problems, ability to reason logically.									
Total Personality Point Rating:									
II. Performance: (a) Personal productivity Consider use of own working time and amount of work done personally (not by unit for which person rated is responsible); consider also diligence in fulfilling duties.									
(b) Productivity of unit for which responsible Consider amount of output or accomplishment of satisfactory quality.									
(c) Personal efficiency Consider promptness in completing work for which person rated is personally responsible; care and accuracy in completing necessary records and reports.									
(d) Efficiency of unit for which responsible Consider economy in operation; prevention of waste of material, time and equipment; accident record of subordinates; care and orderliness of equipment and tools.									

Total Performance Point Rating:
III. Executive Capacities:
(a) Initiative
Consider energy, ingenuity, self-starting ability
(b) Organizing ability
Consider ability to select effective personnel, to plan and coordinate systematically, to determine policies and make clear assignments of responsibility and authority
(c) Leadership
Consider ability to influence others by examples of good work qualities for inspiring others, teaching ability, patience and firmness in dealing with subordinates, freedom from prejudice and bias
(d) Cooperation
Consider capacities for teamwork, freedom from jealousy, willingness to subordinate personal desires, loyalty to fellow supervisors, company officials, etc
Total Executive Capacities Point Rating.

DO NOT FILL IN THIS SPACE
Rating Summary:
I Personality
II Performance
III Executive Capacities

Total Point Rating:
Rated by
Position

Over-all Rating Scale
(Expressed as percentage of total possible score)

88-100	Superior
63-87	Above Average
38-62	Average
13-37	Below Average
0-12	Unsatisfactory

Reviewed by
Filed
date

Fig 8

The theory supporting this method of analysis is undoubtedly sound; job specifications should precede any attempts at rating, and the results of such job summaries should be translated into human qualities. The difficulties with the scale are common to all simplified five-point rating scales, and in this case these are complicated by the supplementary mathematical demands that are placed on the rater. Unless there is an unusually effective personnel department, it is not easy to persuade superintendents to recheck the scales; when that demand is complicated by an undue amount of elementary calculation, the possibility of securing cooperation in completing the scales is reduced.

Another variation of the graphic scale is the form used by Stevens and Wonderlic[1] in a large financial organization. Success in the organization is estimated as being determined by the degree to which the employee possesses the following qualities: good work habits, verbal facility, originality, social adaptability, leadership, capacity for development, and present general ability and value to the company. Each trait is given a clear explanation, and the supervisor is asked to rate all the members of his group at the same time. Trait Number 1 will illustrate the method used.

TRAIT NUMBER 1

Read this description carefully.

Some men are very industrious. They are prompt at work, persistent in solving their problems, careful of details, and display that type of intelligent performance which gives the manager confidence in them as dependable, thorough workers.

Other men are not so industrious. They do not display extreme interest or satisfaction in their work. They give up too easily on hard problems. They are careless of little things and cause the manager to feel uneasy. He is not sure that they have expended the utmost intelligent effort in the performance of their tasks.

In between these extremes are found varying degrees of work effectiveness. Please make your estimate of the men on what you have observed in working with them.

Place a check (√) along the line at a point where you think the man actually stands.

1. ______________________________ | | | | | | | | | | | | | | |

Name	Position	Has extremely valuable work habits	Ordinary work habits	Indifferent work habits.

Give specific instances of behavior on which you base your judgment ( ) Unable to observe

____

2.

Name Position etc.

[1] STEVENS, S. N., and E. F. WONDERLIC, An Effective Revision of the Rating Technique, *Personnel Jour.*, 13: 125–134, 1934.

All the men under the direction of one foreman or supervisor are listed on one sheet, and the officer is asked to rate all at the same time. Correlations between first and second ratings range from .48 to .72; between second and third ratings, from .54 to .79.

A scale which combines some of the features of the early O'Rourke scale and some of those of Wonderlic's is used by the General Electric Company.[1] At the end of the first 6 months each individual is rated independently by three people familiar with his work. The ratings are summarized on a fourth sheet (using different colors for each rating), and the students in training call at the supervisor's office to study their respective sheets as a means of checking up on their progress. They are rated on the following factors:

I. Value on Assigned Work

Rate the employee on his productivity for the company as compared with the opportunities presented by his job. You should compare the things he did which were of value to the company with the opportunities he had.

Exceptionally high, Excellent		Good	Fair	Indifferent	
10	9	8	7	6	5

II. Capacity for Future Growth

Consider this employee's capacity for future growth in the company. Is the work he is now doing the limit of his capabilities, or could he do work of increased scope and difficulty? Is he just about equal to the demands of his present position, or has he the capacity for increased responsibility? Age, health, mental ability, personality, character, and record for accomplishment are all to be taken into account in making this rating.

Has great possibilities		Should advance rapidly	Shows some promise	Has approximately reached his limit	Decreasing in efficiency
10	9	8	7	6	5

Is this employee now ready for increased responsibility? ____________________
If so, what is your recommendation with respect to promotion? ____________________

____

III. Aptitude and Leadership

Check the proper line to indicate the kind of work the employee could do successfully. More than one kind of ability may be checked. The position of the check mark from left to right should indicate the degree to which he possesses administrative ability.

[1] FREDERICK, M. L., Business Internship at G. E., *Personnel*, 13 (No. 2): 37–39, 1936.

	Marked capacity as an executive	Some supervising ability	Individual worker only
Sales			
Manufacturing			
Engineering			
Research			
Accounting and finance			
Others (describe)			

IV. Personality Traits

Initiative	Requires only general instructions		Needs little supervision		Needs undue supervision	
	10	9	8	7	6	5
Persistence	Sees a job through in spite of difficulties		Not discouraged by difficulties		Gives up easily	
	10	9	8	7	6	5
Skill in presentation of facts	Clear and convincing		Expresses himself clearly		Often fails to make his meaning clear	
	10	9	8	7	6	5
Power of analysis	Grasps essentials very quickly		Usually quick to grasp essentials		Apt to overlook the essential elements	
	10	9	8	7	6	5
Impression on others	Highly pleasing		Generally pleasing		Not altogether satisfactory	
	10	9	8	7	6	5

What outstanding characteristics will help his advancement?________________

What qualities will hinder his future development?________________

Give any other pertinent facts which should be known concerning this employee

____

Rated by________________________ Date____________

The advantages of such graphic rating scales are: (*a*) they are simple and easily understood, (*b*) they are interesting; not much motivation is needed to do the checking, (*c*) they are quickly filled out, (*d*) they free the rater from direct quantitative terms, (*e*) they give the rater a chance to make fine discriminations, (*f*) they allow comparable ratings, (*g*) they permit the use of a scoring method that is alterable at will.

On the other hand, many objections have been raised against them, and in many industries today they are being replaced by the more factual type of scale. The following are their major weaknesses:

a. They necessarily deal with abstractions which mean one thing to one person and another to the second Rating abstractions necessitates translating activities into generalities and giving interpretations of behavior. The introduction of these variables adds to the unreliability of the scale.

b. The rating officer is usually unable to hold in his mind at the one time all the pertinent facts that might affect his ratings; one or two experiences becloud all others.

c. The rating officer cannot easily evaluate and weigh, without some artificial scheme, the facts in his possession that he can remember; some that are very important will be placed on a par with minor issues.

d. Emotional attitudes producing a "halo" effect, intellectual inadequacy on the part of the rater, and a reluctance on the part of most rating officers to make adverse judgments, all contribute to its unreliability.

e. Symonds has shown[1] that the average reliability coefficient of the graphic rating scale is approximately .55. With so low a reliability, it is necessary to have eight independent ratings in order to get reliable results.

f. Repeated studies[2] have shown that there are some traits, *e.g.*, love of sports, interest in politics, popularity, leadership—in general, those traits that give objective demonstration of their nature frequently—which can be rated; whereas there are other traits, *e.g.*, caution, recklessness, moral and social qualities, impulsiveness—in general those qualities that vary from time to time and in different situations, "subjective" traits—which show no consistency in the judgments made on them by any two raters. Traits representing individuals' reactions to objective things can usually be rated, whereas those representing reactions to people cannot.

THE USES OF RATING SCALES

There is no doubt today about the value and effectiveness of well-constructed rating scales. They have become an integral part of personnel work, and are used more widely than any other one tool that has been the product of psychological research. The chief uses to which they are put in industry and business are

a. As criteria in the development of selection tests. Both rating scales and tests presuppose thorough job analyses and the interpretation of their findings in terms of human capacities or behavioral patterns. If they are interpreted in terms of capacities, the more subjective type of scale is commonly used, with defined abstractions as the items constituting the divisions of the scale. If patterns are used, specific behavioral acts form the contents of the scale, in which case the method used by Richardson at Procter & Gamble's provides a workable procedure.

b. As a means of gaining estimates of progress for transfer and promotion. They are the most common tool in use today. The usual choice is between the construction of rating scales and the complete dependence on the unguided judgment of one or more officers. As a means of convincing the employee of the justice of the decision, the rating scale has value that no other tool provides. In this connection the practice of the General Electric Company sets a pace that is noteworthy. To give an ambitious aspirant a comprehensive picture of the impression he is leaving with others is one of the best spurs he can receive.

[1] SYMONDS, P. M., *Diagnosing Personality and Conduct*, p. 96, D. Appleton-Century Company, Inc., New York, 1931.

[2] See, for example, ALLPORT, G. W., *Psychol. Bull.* 18: 441–455, 1921; ARLITT, A. H., *Psychol. Bull.*, 23: 617–619, 1926; DOREM, R. M., *Jour. Applied Psychol.*, 10: 502–518, 1926; NORSEWORTHY, N., The Validity of Judgments of Character in *Essays, Philosophical and Psychological, in Honor of William James*, pp. 553–567, Longmans, Green & Company, New York, 1908.

c. As a basis for determining wage increases. The sole justification for wage increase is the increased value to the company of the employee; an estimate of that value should not be dependent upon casual remarks and snap judgments, decided hurriedly and with resulting dissatisfaction to the employee. A denial of a request for an increase should be supported by objective records. In situations in which production records are not available, or even if available are but one factor in determining wage increase, the comparison between an employee's standing on a rating scale in two successive intervals provides management with a fairly reliable estimate of his direction of improvement or the stage of stagnation, and gives an unanswerable argument to the employee for the "why" of his *status quo.*

d. To evaluate the effects of training. Whether the form of training be company courses or company-sponsored courses in local institutions or correspondence courses undertaken by the employee, the mere record of his having taken the course is of little value in itself; the important issue is the degree in which the training has contributed to the effectiveness of the employee; an estimate of that contribution is provided by means of the rating scale.

e. Sometimes of value in hiring and placing a new employee. The limited use to which they are put in that connection is due to the difficulty of getting suitable raters who know the candidate in those aspects of his promise which are of value on the job; in such cases the factual, objective, rating scale is usually impractical, whereas the subjective, abstract type of scale has some, though limited, value. The tendency of "outside" raters to be guided by their own attitude toward the person, and to deal characteristically in "averages" or "superlatives" results in such varied pictures of an applicant that the joint result is a compound of contradictions.

f. Occasionally, to determine the eligibility of certain employees for sharing in some types of bonus and profit plans. (For this see the chapter on Motivating the Employee.)

g. Occasionally, to select those employees who are to be retained at times when the management finds it necessary to reduce its force.[1]

Cautions in the Use of the Rating Scale.—In view of the widespread use of rating scales, the dangers to which their use is exposed may be summarized, and the procedures that should regulate their use outlined.

1. The *form* of the rating scale is of relatively minor importance in comparison with the use that is to be made of rating results. Ratings are made for a purpose: to determine acceptability in an organization; to decide whether a person should be promoted, demoted, or left as is; and to decide whether or not he should share in such privileges as grants for training purposes. Someone has to collect the joint judgments and use them as a basis for action. When the resulting recommendation is given to the employee, there should be some justification for the judgment; such cannot be given unless there are specific instances to support the judgment. The rating scale should provide opportunities for recording bases on which judgments, especially those at either end of the scale, are made.

[1] See A Report on Rating of Foremen, issued in 1923 by the Policy Holders' Service Bureau, Metropolitan Life Insurance Company, New York.

2. Those who rate others should be trained in the art of rating and informed of the importance and use of their judgments. The tendency of supervisors to pass in a preponderance of average judgments is due to the failure of those directing the rating to give proper training. With adequate coaching, the average supervisor can become familiar with the method by which ratings may be both valid and significant. One fairly common practice is to instruct the supervisors to take each quality separately and arrange the ratees in rank order in terms of that quality. When the relative rank position has been secured, even if the whole group of employees is placed in only three classes on any one trait, the problem of transferring judgments to scale degrees is a matter of simple arithmetic.

3. The use of a single rating scale for all employees should be abandoned. No workable single rating scale can be constructed that has significance for all types of employees for all purposes. Certainly there should be different scales for the production employees, the office employees, and the salesmen; but, more important still, there should be different scales for the same employee when different uses are to be made of the results. The factors that are to be rated when employees are considered for supervisory positions differ from those being considered when promotion is in order, and these differ from those that are to be appraised when a person is being hired. Even in the hiring situation, the rating scale differs according to the type of work for which the applicant is being considered.

4. The contents of a rating scale should be governed by two factors:

a. The situational demands in terms of which the person is being judged.

b. The extent to which opportunities are present, or can be created, for forming an estimate of these qualities.

It is the practice of some personnel departments to provide raters with instruction sheets for each rating form; these include directions for completing the form and also suggestions and situations that are specific to the workplace, on which the qualities may be appraised. A golden rule that might well be observed by departments that ask supervisors for periodic ratings is this: Never ask for the rating of any quality unless you can show the specific work situation in which the quality is expressed.

MEASURES OF ATTITUDES

Of equal importance to the task of appraising employees' ability, promise, and work performance is the task of appraising their feelings about and loyalty to the organization. Job satisfaction is determined by two major factors, the extent to which the demands of the job equate with ability level and the enthusiasm for and loyalty to the organization that the job makes possible. Unless ability demands are supported by

satisfied feelings, interest in the work will wane and antagonism toward the organization is inevitable. The extent to which these develop determines the attitude that the employee takes toward his workplace. The task of appraising that attitude and providing satisfactory tools for creating a more favorable one are recognized as among the most challenging problems that confront personnel departments.

Factors Determining Attitudes.—Before cataloguing appraisal tools it may be well to summarize the factors that determine employees' attitudes and feelings; it is the extent to which the tools make accurate appraisals of these factors that their disclosures will be significant to management. The following summary of factors is based on a number of studies that the author has conducted in office and industrial situations.

a. The extent to which the job provides a satisfactory challenge to the abilities and interests of the employee. Work that is "out of line" with the capacities of the employee will be a constant irritant. Examples of such are found in the checker who is incapable of attending to details, the foreman who may have more ability than his position demands but knows little or nothing about handling men, the supervisor whose work constantly demands the formulation of procedure plans and whose abilities are limited to operational processes, and the secretary whose knowledge of English is limited to correct spelling. Jobs that result in frequent errors and discards are sources of dissatisfaction. The source can be eliminated only when the shortcomings of the employee are equated with job demands.

b. The extent to which work associates measure up, or down, to the social aspiration level of the employee. To be satisfied with a job an employee must be satisfied with his daily companions. This satisfaction is determined by the extent to which he is acceptable to his fellow workers and accepts and respects them. Such acceptability is determined by a number of factors: the communion of interests, the cooperation that is given to him when he is being inducted into work processes, the extent to which the group provides channels for the realization of his social values, and the extent to which his achievements, opinions, and capacities are given recognition. To appraise the employee's loyalty to an organization, a valid tool must appraise the extent to which the work situation provides opportunities for the satisfaction of these interests and desires.

c. The extent to which the organization and/or the community provide opportunities for self-development and for the realization of personal values. The individual values that the company or the community is expected to provide vary from person to person; they may be of different types: a chance to further one's specialized training, an opportunity to participate in the activities of one's pet club, accessibility to sources of information that are essential for the continuation of an interest, or channels through which one's political, social, economic, or religious values may be realized. These are potent determiners of job satisfaction and must be appraised if an estimate is to be made of the attitude of the employee.

d. The extent to which the work situation provides sources of annoyance. These annoyances are of two types: human and material. The human annoyances are determined by the frequency, proximity, and relative position of associates who represent focal points of complaints, frustrated ambitions, and rivalries; the material annoyances are determined by the frequency with which minor remedial situations are the sources of impediments to the flow of work. Frequently the work situation

is studded with minor physical conditions that irritate because of their constancy, and with minor human irritants that become centers of uncertainty and fear. Their presence is a potent force in determining attitude toward the job.

e. The extent to which the immediate supervisors measure up to the expectations of the employee. These expectations vary from man to man; some of them are unreasonable, and many of them are impossible. The factors that determine satisfactory supervisory-employee relationships are most commonly determined by the extent to which each worker is given fair, considerate, and impartial treatment. Supplementing that, as major considerations, are the extent to which assistance is given to the employee in any of his job problems, the manner in which supervisors are sources of aid in the solutions of personal problems, and the completeness with which supervisors judge individual worth. The relations that are established between the most closely operating members of the different levels of a line organization help determine the loyalty level of employees; they should be appraised in any estimate of employee attitude.

TOOLS USED TO APPRAISE ATTITUDES

The tools that are used to appraise employee attitude are as follows:

A. Supervisors' Reports.—These are given periodically or intermittently, according to the presence or absence of the arrangements for such procedure by the controlling personnel; they are frequently given in unsystematic form and used as a basis for determining promotion, dismissal, or retention of the *status quo*. They rarely consist of anything more than general judgments; are usually given in the form of "satisfactory," "exceptional or good," and "unsatisfactory"; and are never analyzed into the factors that determine attitude. When given as other than "satisfactory," they are based on one or two isolated instances, which are rarely analyzed or followed through to the causes of the incident.

The value of such judgments is a moot issue; as indexes of attitude they are of but little value because of supervisors' lack of knowledge of the factors that determine attitude and because of the tendency to judge satisfactoriness in terms of work level, obedience, and subservience. Even when four or five factors are used as the basis of judgment of satisfactoriness, the disclosure does not necessarily have any bearing on, or relation to, the attitude of an employee, who may harbor discontent for some time before it is reflected in work records.

B. The Open-door Method.—This is usually based on the supposition, "Ours is a perfectly democratic company; we have the door open and whenever employees have anything to complain about they are welcome to come in and lay it on the table." The complacency with which this supposition is assumed to be the royal road that discloses attitude is the most frequent barrier to the disclosure of attitude. The value of the open-door policy depends on a number of factors:

a. The extent to which foremen will encourage or permit employees to go over their heads and report to management an issue that affects the departments they control.

b. The success that has attended the use of the method by other employees. If the open-door policy has been circumscribed by such restrictions as the necessity of using it after work hours; the certainty that complaints will result in incriminations; the assurance that complaints against superiors will result in conferences in which the foreman "can't be let down"; and the feeling that the frequent use of the open door will result in the acquisition of such epithets as "sneaker," "chronic complainer," and "usurper"; if any of these conditions prevail, the open-door policy is sound neither in theory nor in practice. At its best the merits of the open-door policy are determined by the speed and ease with which the interviewer can unearth underlying causes of friction, and by the effectiveness with which the causes can be removed.

C. The Periodic Employee Interview.—This may be in guided or unguided form, at regular or irregular intervals, and with or without the approval of the employees. Its most frequent use is at the time when a threatened conflict is in the offing or has been surmounted, and its avowed purpose is to give employees the opportunity to "get things out of their system." Its value is determined by the confidence of the employees in the interviewer, and the adequacy and thoroughness with which the interviewer can help the employee disclose the factors that are strengthening his loyalty or that are destroying a healthy attitude. The difficulties are many.

a. The time that is necessary for satisfactory interviews to be completed is such that, unless there is a larger staff of interviewers than the average personnel department has, the interviews cannot take place more than once a year, and rarely can they be as frequent as that. Continuous interviews of a half hour each will consume more than 3 months with a working force of 1,200, and with the same force the time necessary to cover the same number of interviews during the spare time of a personnel manager increases from months to years.

b. The expense of the interview in both time and disturbance of the work process is such that rarely can any company permit the inconvenience caused by frequent employee absence.

c. Interviewing, to be effective, must be selective in two respects. It must select the key people to be interviewed and it must select the issues that are to be discussed during the interview period. Routine formal interviews rarely disclose the issues that are sources of complaints to employees. A large number of employees complain rarely. The seeds of potential trouble are found in specific issues and among a limited number of employees. For the interview to be effective, the interviewer must know not only those issues about which there have been complaints, but also the factors that are behind the ostensible causes for complaining; he must also know the other-than-work factors that may be potent sources of employee dissatisfaction. To elicit these in an indiscriminate series of half-hour conferences is impossible.

D. The Roving Counselor.—This—a recent method of discovering actual and potential trouble centers—has been in operation in such organizations as the Western Electric and Swift Packing companies for so short a time that its merits and demerits are unknown. Organized for the sake of rendering personal service to employees who have personal

or work-situation problems, as well as in the interests of spotting potentially explosive centers and "nipping them in the bud," it is still in the experimental stages. Starting with one counselor, who mingles with the employees and so gains their confidence that they ask for his advice on both work and personal problems, it extends to the appointment of a number of counselors, each responsible for a section or division, who become confidants of those employees who think that his guidance will help them solve some of their problems. The success of this method depends on the following factors:

a. The extent to which management formulates a consistent policy that acts as a guide to the counselors in determining recommendations. The lack of an announced policy inevitably results in inconsistencies and contradictions.

b. The caliber, tactfulness, and resourcefulness of the counselor. His task compares somewhat with that of a vocational counselor, but his is handicapped by the fact that he rarely has the privacy that counseling demands, he offers a service that he frequently cannot give and that others feel he is not able to give, and unless adequate caution is taken he is regarded as a stooge for management. He must necessarily have had previous experience in the workplace and be the confidant of those who were once his work equals or superiors. To render counseling service under such conditions is unusually difficult, if not impossible.

c. The cooperation that will be given by division heads. Primarily the counselor is undertaking functions that should be their responsibility; while many welcome being released from the personal worries of those who work under them, many others resent the unasked-for cooperation that a would-be missionary is apparently all too eager to hand out.

In spite of the dangers to which this innovation into the work situation is heir, it has been of value in "sensing" sources of trouble and in forestalling situations that, if unknown to management, could develop into troublesome issues.

E. The Periodic Questionnaire.—This method has been developed as a substitute for the interview. It depends for its effectiveness upon a number of factors:

a. The time when it is administered. If it is given at a time when a major issue is before the employees, the distortion that is inevitable will place major emphasis on temporary factors to the exclusion of more significant issues.

b. The extent to which the cooperation of all who are likely to be affected by the results is secured. Some of the results will be in the form of judgments of management at the various levels; unless every level of management is willing to encourage frank expressions of feeling, the periodic surveys will be preceded by the deliberate attempts of foremen and supervisors to court the favor of those for whose work they are responsible.

c. The extent to which employees are assured that a "no-penalty" guarantee means just that. The questionnaire provides employees with an opportunity to "get back" at management for assumed or real injustices that may have been perpetrated. Honest replies to issues that relate to or express such feelings cannot be gained if the aftermath penalizes the employee.

d. The extent to which the disclosures from the survey are followed through. These disclosures will affect both workers and supervisors; they will affect and pertain to some more than others; unless identification of those with improper attitudes or practices is made, the major possible results from the study are nullified. However, that identification must be accompanied by an assurance of efforts to aid the employee in whatever dilemma he may find himself.

Attitude questionnaires are of two types—standardized and unstandardized. The former, which have been concerned with general issues, are rarely used in the business or industrial situation, and when used, they are of but little value. The latter have been found effective in a number of situations. The pioneer in this type of employee study was J. D. Houser; the method that he formulated has been followed by H. B. Bergen, R. L. Hull, A. Kolsted, and others, and has been used not only among first-level employees but also among management groups in factory, sales, and office situations. It consists of a multiple-choice questionnaire covering a number of issues upon which those who complete the form are asked to check one of three to five alternate judgments ranging, as indicators of attitude, from extremely unfavorable to extremely favorable. Each judgment is given an arbitrary value, the total of which represents the employee attitude. Frequently the questionnaire contains 10 general questions the responses to which are supposed to indicate general attitude; these are supplemented by a number of specific questions, in order that attitudes on specific phases of the work situation may be appraised. General questions are illustrated in the following:

In your opinion, are there other companies in (this city) which treat their employees better than (this one) does?

( ) All the others are better
( ) Most of the others are better
( ) About the same
( ) This company is better than most others
( ) This company is the best of all

Specific questions are illustrated in the following:

How much instruction do you get when you are given new work or new methods on the job?

( ) Practically no instruction at all
( ) Not nearly as much as I would like
( ) Almost as much as I would like
( ) All that I could wish for

For the questionnaire to be effective, consideration must be given to the contents, the time and method of administration, the interpretation of the results, and the follow-up work that results from its disclosures.

1. *The Contents.*—These should be determined only after a preliminary study has been made of the types of services that are available

to employees, the extent of employee obligation for such services, the privileges that are offered to and the prohibitions imposed on employees, and the grievances that have been expressed by employees. If the questionnaire is to be administered to supervisors and other officers, some knowledge should be gained of the bounds of their authority and responsibility, of the extent of their participation in company policies and plans, and of the facilities that are offered them to prepare them for meeting their responsibilities. The following principles should govern the determination of the contents of the questionnaire and the form in which it is presented to employees:

a. It should include only those issues on which judgments can be formed because of contacts with, or knowledge about, the issue as it operates in the company in which the study is being made. Issues or practices that are reported to be sources of satisfaction or discontent in adjoining or reported companies should be excluded; knowledge of the value of such has been gained by hearsay, and its value has been determined by its effectiveness in a different social and economic structure; an estimate of its significance in a company where it has not been practiced gives no sound basis for judging its worth. The one possible exception to this principle is when an educational campaign has familiarized employees with the pros and cons of a practice for whose adoption there has been some agitation.

b. It should include all those issues that affect employees; these may be gained from a number of sources: company handbook, company paper, conferences with supervisors and superintendents, and studies of the grievances that have been given to the grievance committee during the previous 12-month period.

c. The alternative judgments that are provided should include all the possible interpretations that employees may pass on the issues being studied. That necessarily varies the number of alternatives to different issues; in some cases it will be possible to express possible attitudes in one of two forms, while in other cases it may be necessary to use five to seven types of judgments. Completeness of description rather than conformity to a superimposed evaluation method should determine the number and choice of alternatives.

d. The issues and judgments should be expressed in such a form that equivocal interpretations are impossible. This cannot be assured unless the most critical as well as the least intelligent of those who are to complete the questionnaire have prejudged its clarity. Quite frequently this necessitates the abandonment of the use of scientific terminology and the adoption of locally significant phrases that convey meanings intelligible to all.

The contents of the questionnaire will vary from company to company, and will vary in the same company according to the nature of the group whose attitude is being studied; problems that are of importance to salesmen differ from those that are of importance to factory employees, and these differ from those that are of importance to either supervisors or office workers. The contents are usually grouped under a few main subheadings, each of which has as many phases as there are aspects of the problem with which employees are concerned. Some indication of the nature of these main categories is given in Table 54, where a list is given

of the major issues in two studies, one for first-line employees and the other for supervisors. The contents that are given in the form of multiple-

TABLE 54.—ISSUES FORMING THE CONTENTS OF ATTITUDE QUESTIONNAIRES

Supervisors	First-line Employees
1. Miscellaneous (5 questions)	1. Miscellaneous (10 questions)
2. Education and training (8)	2. Education and training (5)
3. Relations with work equals and superiors (7)	3. Feelings about work superiors (7)
4. Union activities and relations (6)	4. Social factors (5)
5. Attitude toward financial issues: pay, hours, etc. (6)	5. Remuneration and advancement (5)
	6. Working conditions and pace (8)

choice questions are frequently supplemented by invitations for suggestions and written expressions of opinion on issues that are somewhat controversial; these provide outlets for free expression, at the same time that they frequently result in the discovery of needed improvements or changes that facilitate work and speed up the work process.

2. *The Administration.*—Before a questionnaire is presented to the particular group being studied, it is essential to gain the cooperation of all those who will be affected by its results. If it is to be given to first-line employees, the results will affect the foremen, the superintendents, the union heads, and some administrative officers. The most secure manner in which their cooperation is to be gained is by enlisting their efforts in the construction of the questionnaire. The tentative first edition is reviewed with an administrative officer; his suggestions and corrections are adopted or incorporated in a revised form, which is reviewed with the superintendents; and their suggestions are incorporated in the form that is reviewed with the union heads. Possible criticism of those "up the line" paves the way for the acceptance of possible criticism of coworkers and immediate supervisors.

The conditions under which the study is made are major factors determining the results. The time when it is most commonly asked for—when a strike is threatened or under way—is the most unsatisfactory time to administer it. Secret ballots on the issue at stake can very readily be secured at that time, but the results from these indicate attitude toward or feelings about one issue. That may or may not be indicative of general attitude. Usually the most propitious time is when there is little or nothing of an unusual nature disturbing the employees. The circumstances under which the study is made predetermine the judgments made of the director of the survey. Unfavorable conditions rarely result in the disclosure of undercurrents that are potentially explosive centers.

The time of the day for the survey varies in different companies. Sometimes it will be possible to conduct the survey while work is in process and without any serious interruption in the day's work; more

often it will be necessary to ask the employees to complete the form after the day's work is ended. It is rarely advisable to ask the employees to complete the form at home; exceptions to this are possible in the cases of salesmen and administrative officers. The additional expense that "after-hour" work involves is counterbalanced by the lack of hurry on the part of employees, the freedom with which they discuss bothersome issues with an "outsider," and the sidelights that free conversation throws on issues that do not form part of the contents of the questionnaire. In spite of repeated reviews of the questionnaire before it is administered, it is impossible to include all the issues that are significant to all employees; the administration of the form to small groups in after-work intervals provides an opportunity for discussing problems, and frequently results in a more adequate interpretation of the results from the objective study than would otherwise be possible.

3. *The Interpretation of the Results.*—Interpretations of any findings are determined by two factors—the theoretical presuppositions of the student and the practical recommendations that should result from these interpretations. Previous studies are the most potent force in determining the former, and practicability is, or should be, the most important factor influencing the latter. The common theoretical determiners of attitudes are the extent to which proper credit is given for efforts, the fairness of renumeration, the amount of considerate understanding and appreciation given to the employee, the extent to which merit determines promotion, the degree of security offered by the job, the extent to which the work is interesting, and the physical conditions under which the employee works. Any one or more of these factors may be interpreted as determiners of attitude; rarely will all factors work together in producing a favorable or an unfavorable attitude. Usually one factor—an undesirable foreman, insecurity, lack of opportunity for advancement, or work for which a person is not fitted—is of major importance in determining attitude. That factor may not be a statistically important one in the total score, and it may not be reflected in attitudes toward other issues; its importance is realized when the forces affecting the subcategories are studied.

Results from an attitude study are significant to management to the extent to which they lead to practicable recommendations. These cannot be based on a statistical analysis of the results from a paper-and-pencil study. Recommendations are somewhat determined by the frequency with which undesirable alternatives have been checked; they are valuable insofar as the implicit suggestions, grievances, and criticisms have been checked against possible remedies. These can be known only when the situations and affected individuals are known more intimately than the supervision of a study makes possible.

4. *The Results.*—Results are usually given in two forms—a general score, which serves as a basis for departmental comparisons, and a specific score, which serves as a basis for comparing attitudes on specific issues or situations. The general score is a necessary preliminary to the specific score; it provides mathematical ratios in terms of which those divisions that have low scores are selected for further study; it has but little meaning unless the subsequent study is made. To say that department *A* has a morale score of 7.5 and department *B* has a score of 4.3 conveys little meaning unless the factors that are responsible for *B*'s low score are known. The specific score provides the first step in gathering the raw data in terms of which the factors responsible for the low general score may be known. Moreover, a comparison of specific scores often reveals a relatively low score on one or more issues in situations in which the general score is satisfactorily high. The value of specific scores may be seen by examining Table 55. In the study from which this table is selected, the employees in three departments were asked to give their estimate of the foremen in eight different relationships. The employees were given a choice of from three to five alternatives in each case. The frequency with which undesirable choices were made by the three groups, ranging between 18 and 21 in number, is given in the table.

TABLE 55.—INDEXES OF ATTITUDE TOWARD FOREMEN

Issue judged	Department		
	A	*B*	*C*
He is not qualified for his job	1	6	0
He plans his work poorly	0	5	1
He can't discipline men	1	9	3
He criticizes unjustly	7	7	1
He does not give credit when it is deserved	1	5	2
He is partial to favorites	0	4	1
He never gives a square deal	1	4	0
He won't do anything about complaints	0	4	2

In the above table it is apparent that department *B* has a much more undesirable foreman than the other two; however, the general score of department *B* did not differ significantly from the others. The one issue on which an unfavorable attitude was shown was toward the foreman; and on every phase of their relations with him, at least 25 per cent gave a critical response. Similarly, in department *A* a generally favorable attitude was shown toward the foreman, except in one respect, the manner in which he criticized his men.

These results are typical of those obtained from a detailed study of specific phases of subissues in the general questionnaire. In order that

the potentially explosive centers may be removed, it is frequently necessary to follow up the unidentified study by attempts to identify those who are dissatisfied and who may be potential sources of disorders. When such identification is made, it is usually possible to find remedies that will be to the common advantage of the company and the employee.

THE VALUE OF ATTITUDE STUDIES

The major values of attitude studies may be grouped under four heads:

a. Increased Knowledge about Employees.—When properly constructed, the questionnaire leads to information about the extent to which the employee is satisfied with the type of work he does, the extent to which the work is difficult or easy, the types of work the employee hopes to do and thinks he can do, and the satisfaction he gets from his job. Contrary to common judgments, such studies have disclosed the fact that even the apparently monotonous and boring job is so interesting to some workers that it is preferred. One of the major sources of explosion is the employee who is engaged in one type of activity and who prefers to work at another type.

b. Data for Foreman Training.—Foreman training programs are of three types: canned, conference, and clinical; of these the conference method is the most widely used, but it is gradually being supplanted by the clinical. The basis of the clinical approach is a knowledge of the manner in which the foreman is falling down on the job. The quickest and most reliable method of getting others' judgments of the effectiveness of the foreman is by means of the multiple-choice questionnaire. The specific issues on which foremen fall down and on which they need help are disclosed, and the discussions are taken out of the realm of generalities and are reduced to the specific factors that are conscious problems in the minds of both employees and superintendents.

c. An Appraisal of Personnel Practices.—Many privileges are extended to employees today: rest rooms, rest periods, recreation facilities, pensions, hospitalization, loan privileges, and scores of others. The real motive in providing these accessory expenses is the hope that they will foster employee good will and strengthen company interest and loyalty. The extent to which that hope is realized is determined by the extent to which the privileges are appreciated. They can have a detrimental effect on morale or they can be a constructive force; the manner in which they are accepted and appreciated by employees is revealed by the attitude study, and the basis is provided for their partial elimination or extension.

d. Minor Work-situation Changes.—It might be expected that when suggestion boxes are at every work corner and when the open door provides an opportunity for discussing any kind of complaint, employees would make full use of the opportunities; the differences between the number of situations that have been reported in attitude studies and by means of the suggestion box would indicate that the ultimate requirements for using the suggestion box—identification—militate against its effectiveness. Moreover, many of the most frequently found environmental sources of irritation are regarded as too petty to report through the channel of the suggestion box. The frequency with which these sources are reported in the attitude study and the constancy of their presence would seem to indicate that they are an important cause of irritation and discontent.

These four values are among the significant results of properly conducted attitude studies; there are many other problems on which this

relatively new tool throws light and provides reliable information: how employees feel about the selection methods; what they think of the promotion system; how well safety rules work; where heat, light, and ventilation may be improved; what value some of the incentive methods have; and the relative effectiveness of company-sponsored *vs.* union-sponsored activities in developing company loyalty. Any issue affecting the varied relations that each employee has in his work situation may thus become the subject of study, the results from which may influence policy and action.

Topics for Report

1. Construct a rating scale for the position of teacher of a course in industrial psychology. Rate your teacher on the same, and submit your results.

2. Construct an attitude questionnaire that could be used to measure students' attitude toward the institution in which you study.

3. Interview at least 15 employees and find out the things that are most and least liked in their present job; translate your findings into a multiple-choice questionnaire.

Required Readings

1. ALLPORT, G. W.: *Personality, A Psychological Interpretation*, pp. 286–342, 419–447, Henry Holt and Company, Inc., New York, 1937.
2. HEPNER, H. W.: *Psychology Applied to Life and Work*, pp. 296–326, Prentice-Hall, Inc., New York, 1941.

Supplementary Readings

1. DONALD, W. J. (ed.): *Handbook of Business Administration*, pp. 159–166, 1035–1044, 1200–1206, McGraw-Hill Book Company, Inc., New York, 1931.
2. LIKERT, R.: A Technique for the Measurement of Attitudes, *Arch. Psychol.*, No. 140, Columbia University Press, New York, 1932.
3. HALL, O. M.: Attitudes and Unemployment, *Arch. Psychol.*, No. 165, Columbia University Press, New York, 1934.

CHAPTER IX

TRAINING THE WORKER

The task of training those who have been hired is just as important in business and industry today as is the task of hiring proper workers. The adoption of an adequate method of training is of equal importance with the adoption of proper technique in hiring; and as is the case with the problem of hiring, the task cannot be properly solved unless the nature of the problem is understood and scientific methods are adopted for its solution.

THE NEED FOR TRAINING

Some form of training has always been recognized as an essential part of an organization; regardless of the type of background or preparation any newcomer may have had, the demands of an organization are peculiar to it and necessitate the acquisition of the skills or arts which the particular job imposes on the operator. Introducing the novice to his new job and anticipating a below-average production during the introductory period are the accepted obligations of any supervisory force. But during the past quarter of a century additional training demands have been placed on organizations. Training is no longer limited to the novice; it extends through the whole organization and includes in its scope all, of any rank, who are willing and anxious to learn. Some of this training is simple and limited in nature because of the limited capacities and interests of the worker, while for others the types of training offered in industrial and commercial organizations approximate the breadth and intensity of those offered in a university.

To care for such demands, many companies have established training programs which are optionally all-inclusive, and which give opportunities for the development of each worker at the same time that they provide for heavy production demands in any one division by the transfer of prepared workers from other divisions in the organization. For meeting these requirements, training facilities are available in many present-day organizations for all levels of workers. The beginner, the average worker, the versatile worker, the worker with promotional possibilities, the foremen, the salesmen, and the executives at different levels of the organization—all are included in a comprehensive program under the direction of a specially appointed training director who has at his disposal the

information that complete job analyses have made possible and the best technique that modern experimental pedagogy offers.

In this chapter we are concerned with the nature of the problem as it affects the first-level workers and their foremen. The training program as it affects salesmen, college graduates, and executives will be discussed in later chapters. Fortunately for the training director, the group with which there is the least training problem comprises the largest percentage of the working force. The average worker who "holds down" a job is not particularly anxious about being too much disturbed with changing his position and, if he does, is likely to change to a job quite similar to that on which he has been working for years as an automaton. In this connection the experience of training directors is at variance with well-intentioned reformers who are constantly agitating for freedom from monotony and boredom for the worker; some estimate[1] that not more than 10 per cent of employees are interested in any form of training program. "For the remaining per cent of the working force the training problem, so far as the work of the plant is concerned, is, to a very great extent, one of handling incidental, unorganized, or casual training on the job of job-upgrading basis." For that remaining 10 per cent, however, a definite training program is necessary, a program that is formulated in terms of the following essentials:

a. Inclusive, so that all in the organization who have the capacity to be of greater service to the organization than they are at present may be given the opportunity to develop themselves in terms of organization demands. This necessitates a combing of the contented as well as a hearkening to the ambitious; many of the so-called average workers have developmental capacities which need but a little prodding to be resurrected from a lethargic state. It also implies a knowledge of the entire working force, so that the type of training most suitable for the employee will be selected, instead of the type he thinks he should have.

b. A thorough knowledge of the demands of each position and the relation of any one job to all similar jobs in the organization. No training program can be effective if it is piecemeal; related jobs form a natural pattern. The training director must know them in terms of the similarity in patterns of skills that different jobs demand.

c. The normal length of the training period for each type of skill that is to be acquired. In this connection the acceptance of common practices is one of the most frequent errors. The length of the training period should be the time necessary for a properly chosen employee, subjected to the best training methods, to absorb the job. H. S. Dennison says,[2]

On many jobs it has been possible to qualify apprentices in a year or a year and a half, instead of the four or five years formerly required. In one class of

[1] Cushman, Frank, Federal Bureau for Vocational Education, The Foreman's Place in a Training Program, *Handbook of Business Administration*, ed. by W. J. Donald, p. 1230, McGraw-Hill Book Company, Inc., New York, 1931.

[2] Dennison, Henry S., and J. S. Keir, The Selection, Assignment, and Training of Workers, *Personnel*, 7 (No. 2): 42–51, 1930.

work it has been possible to get new employees up to a regular standard in a period of six weeks instead of the 16 weeks previously necessary; in addition, individuals have been able to earn 20 per cent more in wages after the first month on the job than was ever possible formerly.

d. The complete cooperation of all grades of executives. No training measures can be effective unless they have the support of management and unless those undertaking the training know of that support. Records of improvement should be at the disposal of management, and every officer, from the foremen to the president, should take an active part in the program.

PROBLEMS OF TRAINING

While some of the problems that are incident to a satisfactory training program are peculiar to both the job and the learner, there are some general principles and common problems that characterize each training task. The enumeration of these will indicate the nature of the problem.

The fundamental task of training is the establishment of those habits that are necessary for the efficient performance of the job. But these habits are of different types. Some are concerned with the order of sequence of steps in the performance of the job, others are concerned with the care of tools and materials, others are related to safety measures, and still others involve attitudes and interests. Van Wyck[1] lists the following 20 habits which employees should acquire, and for which some training and guidance should be provided:

a. Cleanliness—of both the person and the workplace.
b. Adequate personal appearance.
c. Getting along with others—with both foremen and fellow workers.
d. Following orders and directions—attentively and exactly.
e. Promptness—in appearing at work and in obeying commands.
f. Keeping busy—the art of stick-to-itiveness.
g. Seeing the job through—persistence.
h. Checking and correcting work—to ensure accuracy.
i. Accuracy in work—to ensure quality.
j. Speed in performing work—to the limit of one's capacity.
k. Neatness in work—avoiding untidiness and undue waste.
l. Cooperation with others—on and off the workplace.
m. Accepting criticism—as a means of self-improvement.
n. Proper conduct on the job—avoiding horseplay.
o. Orderly procedure with the work—no untried short cuts.
p. Proper care of tools, equipment, materials, and supplies.
q. Proper use of tools, power, and equipment.
r. Economy in the use of materials and supplies.
s. Efficient methods of working.
t. Safety and health precautions.

[1] PROSSER, C. A., and P. S. VAN WYCK, *How to Train Shop Workers*, p. 10, American Technical Society, Chicago, 1941.

Some of these habits are incidental parts of the training program; they are adaptations of previously acquired personality characteristics to the demands of new situations; during the job-training period they can be reinforced and their significance can be demonstrated, but their continued functioning depends upon the extent to which prior home and school training has made them second nature. Those that can and must be acquired may properly be classed as occupational skills. Van Wyck divides these into six groups:

a. The Systematic Arrangement of, and Care for, Tools, Equipment, and Supplies.—In this step the apprentice learns to identify the tools and machines needed for the job, and the manner in which they should be cared for; how to handle, protect, and store materials and supplies, and to locate supplies and equipment in their proper place; how to handle scrap and waste, to avoid spoilage, and to protect unfinished work.

b. The Manner in Which Safety Precautions Are Observed.—In this step the apprentice is acquainted with the danger points on the job, the manner in which accidents may be caused, the safeguards that are essential, and the manner in which they are to be used; the emergencies that may arise and the manner in which they should be cared for; the first aid facilities that are available and the manner of their use; the health risk of the job and the precautions that are necessary; and the safety and health regulations that are general rules of the company.

c. The Use of Power Equipment.—In this step the apprentice is acquainted with the manner in which power equipment operates; how it is checked for service; how it starts, stops, and is regulated, how it may be protected and abused; what procedures may be followed to reduce its cost; what troubles may arise and how they may be detected and prevented; and the safety measures and precautions that are to be observed when the power is in use.

d. The Manner in Which Tools and Equipment Are Set Up for the Job.—By both demonstration and practice the apprentice becomes familiar with the proper use of each tool and the manner in which each machine is set up and operates. The simpler tools and machines are the subjects of the first practices; their mastery is followed by explanation of and practice on related and more complex machinery and tools.

e. The Skills That Are Needed for Performing the Operation.—These vary for each operation, but in each one the apprentice is familiarized with the purpose of each operation, the correct manner in which each phase is carried out, the way in which difficulties are avoided or overcome, how measurements are made, how blueprints are interpreted, what short cuts are possible, and what standards are desirable. When operations are broken down into parts, each part forms a teaching unit by itself and is practiced until mastery is assured.

f. The Checks That Are Necessary to Ensure Accuracy.—In the acquisition of these habits the apprentice discovers his possible sources of error, the places where special care is necessary, the danger points in his efforts, and the manner in which his failure to follow established procedures results in substandard work.

The six steps that are enumerated above are sufficient to demonstrate the fact that the task of training an apprentice to operate a machine is not merely that of ensuring his familiarity with the successive steps in the operation. The task is one of adjusting a whole person to a new situa-

tion. The center of that situation is the particular pattern of occupational skill that is to be acquired; and of vital importance to its adequate performance are the attitude that is taken toward the task as a whole, the extent to which the significance and importance of each phase are grasped, and the manner in which previously acquired habits interfere with adequate behavior on the job.

HOW HABITS ARE ACQUIRED

The composite of the qualities and habits that are necessary for the satisfactory performance of any job and for taking its responsibilities is not an acquisition that results from a short intensive training period. It is indeed true that parts of the occupational skill—their sequential steps and their motor-coordination demands—can be reduced to the automatic stage in a relatively short time; but as a prerequisite to the efficient functioning of these skills there are personality characteristics, total bodily habits, and attitudes toward the particular type of work that are as potent determiners of satisfactory work as are the acquired motor skills.

The discovery of the extent to which these desirable characteristics and attitudes exist is a necessary antecedent to any attempt to build up occupational skills. Much of the effort at acquiring skills may be reduced if the deterrents to their efficient functioning are nonexistent. It is true that some of these deterrents can be partially, and probably entirely, overcome during the training period. On the other hand, the more effective that previous experience has been in establishing adequate personal habits and proper attitudes, the less difficult will be the task of acquiring the skill demands of the job. Such qualities as cleanliness, proper personal appearance, obedience to superiors, attention to directions, promptness, industriousness, persistence, carefulness, neatness, and cooperativeness contribute as much to efficient operation as does the acquisition of the proper method of operating tools. Corrective measures for remedying defects in such qualities may be incidental parts of the job-training task; the fact that the present versions of such qualities have been practiced for some time increases the difficulty of the task of improving them, and frequently is responsible for job failure, in spite of the fact that the occupational skills have been mastered. Proof of this is given in a study made by Brewer[1] of the reasons why employees are discharged. While 34.2 per cent were discharged because of lack of skill, 65.8 per cent were discharged for "lack of job wisdom"—or the presence of such qualities as insubordination, laziness, carelessness, and unreliability.

[1] Brewer, J. M., Religion and Vocational Success, *Religious Education*, January, 1930, pp. 1–3.

The first task, then, in enabling others to acquire necessary occupational skills is to select those for training who have the accessory personality habits and attitudes that are vital to success on the job, or to select those whose deficiencies are of a minor type, such as can fairly easily be remedied.

The second task is that of being familiar with the manner in which motor habits are formed. Prosser and Van Wyck[1] have described the fundamental basis of habit formation thus:

> The mind acts like a telephone switchboard, and is said to be capable of making more than three trillion connections. Through experiences inside and

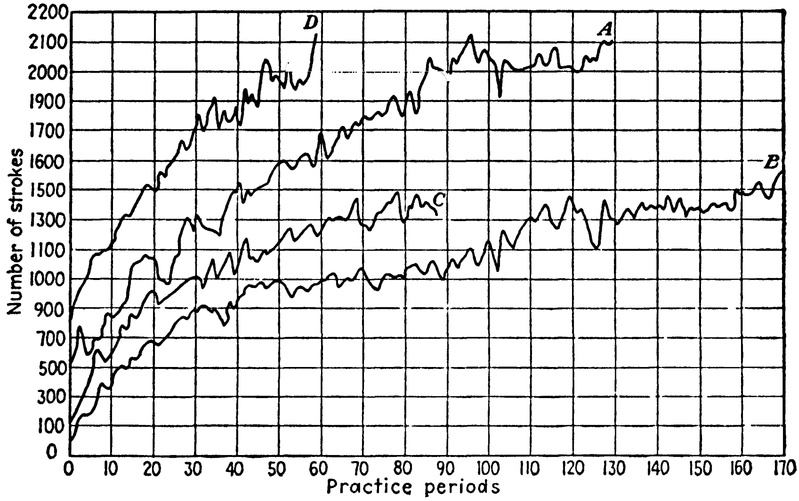


FIG. 9.—Learning curves of three people learning to typewrite (*B* and *D* are the same person).

> outside itself the switchboard wires up automatically—sets up its own associations, connections, and circuits of ideas and actions. By repetition these associations, connections, and circuits may be developed into a pattern. By further repetition this pattern may be fixed and developed into a habit—a more or less automatic or semiautomatic action of the mental switchboard.

But the possibility of multiple connections and the assurance that these connections will be solidified through repetition give no promise that the proper connections will be formed, or that those that are essential to the mastery of any one operation will be established. In nearly every operation there are key points to which attention should be given; the speed with which the habit is acquired depends as much upon the selection of these key points as it does upon the ability of the learner. Granted the selection of the best method, there are features of the learning curve

[1] PROSSER and VAN WYCK, *op. cit.*, p. 23.

that are usually typical of the acquisition of any motor habit. These can best be shown in an illustration. The graph[1] in Fig. 9 gives the learning curve of three people who spent from 58 to 175 practice periods learning to typewrite. *B* and *C* practiced by the sight method, *A* practiced by the touch method; and *D* represents *B*'s learning curve by the touch method after he had learned to type by the sight method. The curves show a number of features that characterize most learning curves. The most important of these are explained here.

1. A rather rapid and continuous rise in the early stages of practice is followed by a slower and more gradual rise in the later stages. This rapid early rise is due to an initial spurt which usually accompanies the first attacks on a problem, the acquisition of a few simple patterns many of which are similar to some that have already been acquired in other situations, and the freedom from fatigue and boredom, which are common experiences at later stages in the task. The decreased rate of growth which characterizes the latter part of the curves, usually called *negative acceleration*, is due to the subjects' reaching their physiological limit. It will be noted that there are variations among the different subjects.

2. In spite of constant objective conditions, there are rather wide daily fluctuations. The time was kept constant daily, and the environmental conditions were identical, and yet despite that uniformity the variations in the same subject from day to day were greater than the average daily improvement. The factors responsible for these variations are subjective and immeasurable—lapses of attention, shift of attitude, waning interest, lowered physical state, loss of sleep, worry, or any personally disturbing factor. The same conditions that are in evidence in these three cases are present in every learner. Variations from day to day that have no relation to the capacity of the student are inevitable accompaniments of progress; it is a very rare person who can keep constantly working at 100 per cent efficiency; the approximations to that indicate the degree of variation.

3. Equally significant are the differences in the learning curves of the different subjects. Some show a considerable number of periods with no improvement, some of them of short duration and others of considerable length; others show a fairly steady rise until the level of their possible accomplishment is reached. (*A* and *B* show a steadier rise and a more gradual improvement than *C* and *D*, while *B* shows less daily variation than the others.) Some show more rapid learning than others; for example, *C* reached the same level in 60 days' practice that *B* did in 140 days. These individual variations in rate of improvement, in level

[1] Book, W. F., *The Psychology of Skill, with Special Reference to Its Acquisition in Typewriting*, pp. 18–23, The University of Montana Press, Missoula, 1908.

of attainment, and in periods of no improvement are due to a number of causes: aptitude for the task, interest in the task, capacity to give constant attention to one type of work, persevering tendencies, physical endurance, and general level of mental ability. They are present in any group of learners, and are the factors that should be estimated before apprentices are selected to learn the trade. The capacity and persevering tendency of the beginner reflect themselves in the learning curve and give fairly conclusive proof of the likely success of the novice when placed on the job.

4. Another feature of the learning curves is the presence of places of no improvement; some of these are of short duration and occur frequently, while others are moderately long. The former lasted from 6 to 8 days in the typewriting experiment, while the latter lasted 17 continuous days in *B*'s case and 33 successive days in *A*'s case. The shorter periods are generally called breathing places, in which no effort is being made to speed up what has been learned or to add on any new habit patterns; the longer periods are generally called *plateaus* and are usually the sequel of a period of rapid rise in the learning curve. They seem to occur when the learner has reached a definite stage in the learning process; for example, both *B* and *C* showed marked plateaus when they were typing at an average rate of between 110 and 120 strokes per minute. They also seem to occur when some phase of the habit pattern has been mastered and the next phase has not been understood. Bryan and Harter, in a noteworthy experiment with telegraphy,[1] found the same occurrences and attribute them to the necessary presence of consolidation periods, in which habits of a lower order are being established before habits of a higher order are acquired; for example, in telegraphy the connections between dots and dashes and individual letters must be made before connections are made with the continuous letters of a word, and these must be consolidated before the connections are made between the signs and the continuous words in a sentence. These resting periods serve to consolidate earlier acquisitions and give a basis for the higher integrations that are necessary for habits of a higher order, of which the already acquired habits are a part. At these stages, new and increased difficulties are met, and a process of adaptation continues for some time before any improvement is shown in the learning curve. Other factors that may be responsible for the periods of no improvement are lapses of attention, fatigue, waning effects of incentives, and contentment with attained level.

5. Another characteristic of the learning process will be noticed if curves *B* and *D* are compared. Both are made by the same person, *B*

[1] Bryan, W. L., and N. Harter, Studies in the Psychology and Physiology of the Telegraphic Languages, *Psychol. Rev.*, 4: 27–55, 1877; 6: 345–375, 1899.

representing his curve when he was learning to typewrite by the touch method, and *D* representing his learning curve for the sight method. The *D* learning curve was the result of practice periods for 58 successive days after he had spent 170 days practicing by the sight method. Some striking differences are apparent: the curve rises regularly and rapidly, the physiological limit is reached in a much shorter time in the *D* curve than in the *B* curve, the level of attainment is much greater in the *D* curve, and the plateaus are of much shorter duration. Some of these factors are, of course, due to the use of the touch method, others are due to the additional amount of practice in what is fundamentally the same kind of task, with the exception of the change from the sight to the touch method, but the carry-over effect is quite marked. Between the two processes there are many identical elements, and because of this the second task is assimilated at a much more rapid pace than the first. The same principle holds true in all learning processes: any one task having in it a number of elements that are similar to those in other situations already learned will be mastered rapidly, provided advantage is taken of the elements that are known. It is on this principle, proceeding from the known to the unknown, that rapid learning depends.

TEACHING OTHERS TO ACQUIRE MOTOR SKILLS

In addition to the knowledge of the way skills may be acquired by the learner there is an equally important factor that helps determine the ease with which the skill will be acquired, *i.e.*, the method of teaching used by the instructor. The acquisition of motor skills is a cooperative venture, in which the most effective methods of teaching are combined with the desirable attitudes and personal habit patterns in such a manner that the acquisition of the skill is a speedy and pleasurable experience. The aids that are of value to the instructor may be grouped under eight headings.

1. Finding Out the Most Natural Manner in Which the Operation May Be Performed.—The basis for correct teaching methods is the knowledge that job analyses and time-and-motion studies have made available; these have usually shown that the motions and efforts that are necessary for the successful performance of any motor task can be reduced to set patterns and combined into a series of movements, and that these movements can be grouped into easily acquired patterns. The manner in which these movements may be developed into a pattern has been given by C. S. Myers.[1]

[1] Myers, C. S., *Industrial Psychology*, pp. 87–88, The People's Institute Publishing Company, New York, 1925.

a. Successive movements should be so related that one easily passes into the next, and the joint pattern permits an automatic performance of the various movements in rhythmic form.

b. The movements should be as few as possible, and should move in a continuous curve rather than show abrupt changes of direction.

c. The simultaneous use of both hands should be encouraged.

d. When a forcible stroke is required, the movements and the material of the worker should be so arranged that, as far as practicable, the stroke is delivered when it has reached the greatest momentum.

2. Giving the Novice a Bird's-eye View of the Whole Problem.—The significance of separate tasks can be appreciated only when they are seen in the total setting. The beginner grasps the significance of gross totals more readily than he does the importance of minor parts. Representing a problem or a situation in pictorial or graphic form stimulates the imagination, and arouses the curiosity of the beginner regarding the interrelations of the different parts. This does not imply that the problem is to be taught by the "whole" method. While there has been repeated proof of the value of that method in the assimilating of verbal material, there is no conclusive proof of its validity in the acquiring of motor habits.[1] Parts which form a unitary whole and which are to be performed in one movement or one easily acquired sequence of movements should be united into one learning pattern; but when abrupt changes of behavior form a necessary part of a total pattern, there is no advantage in using the "whole" method of learning.

3. Presenting the Movements to Be Acquired in Motion-picture Form.—This method should be used when possible. Photographed studies of many jobs now facilitate the presentation of screen pictures showing the differences between right and wrong ways of carrying through an operation. The contrast between the motions made by the poor or average worker and the successful worker makes a more vivid impression when thrown on the screen than when exhibited on the job. An interesting use of the film in representing contrasting ways of doing a task is reported by Lyons and Company, Ltd.[2] They have developed a film, entitled "Noona, be Nippy," in which they present a story of two waitresses—one who measures up to the standards required by the organization and the other, a careless, nonattentive worker, who gives very little attention to service instructions and who is constantly forgetting duties and causing confusions. The amusing pictures of disgruntled customers, spilled beverages, and irritated coworkers serve to illustrate the effect of poor training better than any words of warning could. The

[1] See Viteles, Morris, *Industrial Psychology*, W. W. Norton & Company, Inc., New York, 1932.

[2] Brooks, Jack, Using the Screen to Train Personnel, *Chain Store Age*, March, 1930, pp. 37–39.

film also pictures the correct way of performing all the operations that are the responsibilities of a waitress—even to the point of holding a bottle of ale between two fingers underneath a tray! The pictorial representation of contrasting ways in which a task may be performed conveys general ideas of methods to be avoided; it is not likely to be sufficient to acquaint the beginner with correct motions, which must be acquired.

4. Providing Proper Incentives.—No person will exert his utmost powers unless he is motivated. The nature of the motivating force varies with different people; some are spurred on by the promise of increased financial returns; some by watching their own progress, especially when it is graphically represented; some by an encouraging word from someone in authority; some by an instructor's taking a personal interest in their problems; some by emulating a competitor; and some by being shown the importance in the finished product of the particular operation that is being learned. For some the pride of accomplishment is sufficient, while for others the only factor that can arouse their best efforts is found in immediate cash returns or the enhancement of their egos. Regardless of the nature of the incentive, the use of some form is the only way to assure the expenditure of whatever energy and effort the beginner has in relation to the task to be learned. A word of caution is necessary, however. Too much enthusiasm hinders rather than helps the making of fine coordinations. In acquiring motor habits that demand fine muscular adjustments, it is important to moderate enthusiasms and maintain emotional balance; a steady hand and an excited bodily state are rare bedfellows.

5. Relating the Unknown to the Known.—The new is learned in terms of the old, the unfamiliar in terms of the familiar. Acquaintance with the new is best accomplished by making the unknown an extension of the known. The learning process begins with the known and grows by assimilation rather than be accretion. But the familiar parts of each new task are peculiar to each learner, and can be known only through individual examination and discovery. Such an examination should be the starting point of additional information, and should be used as the center around which the pattern of knowledge is to be built. The initial stages of any new motor habit are rooted in old and similar habits and are extensions of them; a modification of the old and an establishment to the new are the preliminary steps in the acquisition of a new pattern.

6. Concentrating on Accuracy Rather Than on Speed.—Repeated experiments have given conclusive proof that "if accuracy is stressed in early training, not only will the quality of workmanship be better at the end of the period, but speed will also be greater than under conditions of learning where quantity of production is stressed early in the

training period."[1] One experiment will illustrate the general nature of the conclusions. Myers reports an experiment[2] on learning to typewrite. Two squads of seven girls each practiced typing 3 minutes a day for 36 consecutive days, one group working for accuracy and the other working for speed. At the end of the practice period there was no difference in the average rate of the two squads. Four months elapsed without either squad's practicing, at the end of which time each squad typed, as quickly as possible, unfamiliar material for a 10-minute period. The speed group averaged 383 words and made 2.2 per cent errors, while the accuracy group averaged 451 words and made 1.2 per cent errors. If speed is stressed at the beginning of the formation of a habit, the subject is moderately sure to try to fit old patterns of behavior into a new mold, with the usual result—a distortion of the mold and an inhibiting of the free expression of the patterns.

7. Ensuring the Cooperation of the Learner.—Convince the learner that the established pattern is the best possible one for the situation. Show him the reasons for, and advantages of, the pattern. Motivate him by permitting him to do that part first that is easiest for him. Direct him into those parts that require coarse muscular adjustment first; and space his learning periods so that fatigue and boredom are not experienced.

8. Checking the Progress of the Trainee.—Some type of systematic follow-up of the progress of trainees is essential; the type adopted depends largely on the nature of the task and the manner in which the trainee can be motivated by reports on progress. The N.I.C.B. reports[3] that those responsible for training apprentices agree that checks should be in the following four directions:

a. In practice, does the training adequately fit men for the job for which it is designed?
b. Is the instruction being absorbed by the trainees?
c. Is the training schedule being adhered to?
d. Are personal difficulties of trainees being given consideration and attention?

LENGTH OF THE TRAINING PERIOD

The length of the period depends upon the nature of the skill to be acquired, the type of training technique that is used, and the learning capacity of the employee. Skills vary in the ease with which they can be acquired and in the form the habit pattern takes when the skill is acquired. The ideal type of habit pattern—that which the Gilbreths

[1] VITELES, *op. cit.*, p. 429.

[2] MYERS, G. E., Speed versus Accuracy in the Development of Industrial Skill, *Jour. Personnel Res.*, 4: 20–22, 1925.

[3] Quick-training Procedures, *Studies in Personnel Policy*, No. 26, p. 4, The Conference Board, New York, 1941.

aim at making acquired in all the movements necessary for doing any job—is naturally made in rhythmical form, and with each successive step in proper sequence, so that one easily leads to the next. "Naturally made," however, conveys very little meaning to a novice who is placed before a machine and told to operate it in the natural manner; so-called natural movements have to be acquired, but in their acquisition the pattern of successive movements that is most readily formed determines the successive factors to be learned.

The type of training technique adopted is a major determinant of the length of the training period. The most successful form will vary with different employees, and will be determined by their interest in that particular type of work, their aptness for doing it, the type of imagery that they most frequently use, and the capability of the person under whom they work for keeping their learning capacity functioning at its best. The learning capacity of the employee is definitely set and not easily subject to change; just as there is a definite walking speed and racing speed beyond which the subject cannot go, so there is a definite operating rate of any habit pattern beyond which the person cannot function for any length of time—his physiological limit. The nature and importance of these factors have been discussed in the section of this chapter called How Habits Are Acquired. In spite of these variations in acquiring skill patterns, the task of learning different types of work is usually regulated in commonly set time intervals. Some indication of the length of the training period for some jobs is given in Table 56 and Fig. 10. The table is taken from data collected by interviewing people who have had considerable experience in training beginners in all the types of work given; the chart is the joint judgment of 88 firms representing 31 different industries.

The amount of training necessary for the different trades given in the first column of Table 56 was the joint judgment of the foremen in 125 concerns in the electrical industry, 61 in the machine trades, and 82 in the printing industry, and in all cases the length of time was the normal requirement for employment. All the industries were in or near Springfield, Mass.

The percentages given in Fig. 10 were gathered in another section of the country. C. A. Koepke of the Minnesota Employment Stabilization Research Institute, with the assistance of 10 to 14 graduates of the University of Minnesota mechanical engineering department, visited 88 firms representing 31 industries, and in response to the query, "What is the training time necessary to work undirected on this operation?" received the replies summarized in the chart on page 223. "Of all the operations surveyed, 22 per cent required a training time of less than one-half a month for their satisfactory performance; 33 per cent

TABLE 56.—LENGTH OF TRAINING PERIOD IN THREE INDUSTRIES[1]

Trade	Time required, years	Divisions of trade
Electrical industry	−1	F.D. switchboard operators, telegraph and telephone conduit men, meter readers and installers, radio adjusters
	1–2	Panel wiring, time-clock assembly, bell-board wiring, meter clockwork, laboratory panel work, switchboard operators, radio service men
	2–3	Hospital signal work, repairing electrical products
	3–4	Motor electricians, motor winders, transformer winders and assemblers, coil winders, motor testers, fire-department electricians, factory, building and store maintenance, refrigerators, oil-burner work, telegraph and telephone (draftsmen, supervisors, linemen, repairmen, installers), cable splicers, street railway (electricians, armature men, linemen, repairmen, overhauling shop), time system service men, U.E.L. (linemen, draftsmen, apprentices, testers, electricians), line workers, watch engineers
	5–6	Telegraph and telephone foremen and test men, time system engineers
	8+	Telegraph and telephone wire chief
Machine	−1	Broaching, drill press, hand millers, inspectors, milling machines, motor workers, multiple drill presses, profilers, punch presses, radial drill presses, solderers, speed lathes, spot welders, threaders
	1–2	Assemblers, benchwork, brazers, gear shapers, lathers, planers, plating, shapers, thread millers, tool-crib attendants, turret lathers, vertical shapers, welders, winding-machine operators
	3–4	Airplane machine work, automatic screw machine, blacksmith, boring mill, certerless grinders, die (makers, setters, sinkers), draftsmen, drop forgers, engravers, gear millers, grinders, heat treaters, Keller machines, machinists, maintenance, millwrights, painters, polishers, toolmakers
	5–6	Machine operators
	8	Garnet mechanics
	10	Foremen
Printing industry	−1	Paper cutters, feeders
	1–2	Bindery workers, copy holders, lithography (feeders and helpers), offset work (feeders and helpers), cylinder feeders and helpers, rotary helpers
	3–4	Die makers, linotype operators and machinists, lithograph (artists, camera men. transfer men), Ludlow operators, monotype casters and operators, cylinder pressmen, job pressmen, small shop printers, proofreaders, stonemen
	5–6	Hand compositors, electrotypers, engravers, pressmen, newspaper composing, offset work and rotary pressmen, photoengraving, stereotypes
	7–8	Foremen for bindery, compositors and lithographers, as well as for offset work, presswork, rotary and photoengraving

[1] This table is compiled from the following reports of surveys of trades and industries, conducted by the city of Springfield in cooperation with the Division of Vocational Education in Massachusetts, Department of Education, and the Division of Vocational Education, Department of the Interior:

I. *The Electrical Trade*, January, 1933, pp. 20–21.

II. *The Machine Trade*, November, 1933, pp. 22–24.

III. *The Printing Industry*, September, 1934, pp. 22–23.

Similar reports for the baking and woodworking industries are also completed.

required from one-half to two months; 17 per cent from three to nine months; 16 per cent from 10 months to two years; 8 per cent from two to four years, and 4 per cent four years or more."[1] In each of the industries represented in Fig. 10, there are numbers of trades, which vary in training requirements from trade to trade. "Hand-operated plants and mechanized plants within the same industry do not require

[1] KOEPKE, C. A., A Job Analysis Survey, *Occupations*, 12 (No. 10): 15–34, 1493.

the same training time for their operations. In machine bakeries a training period of less than nine months was sufficient for 86 per cent

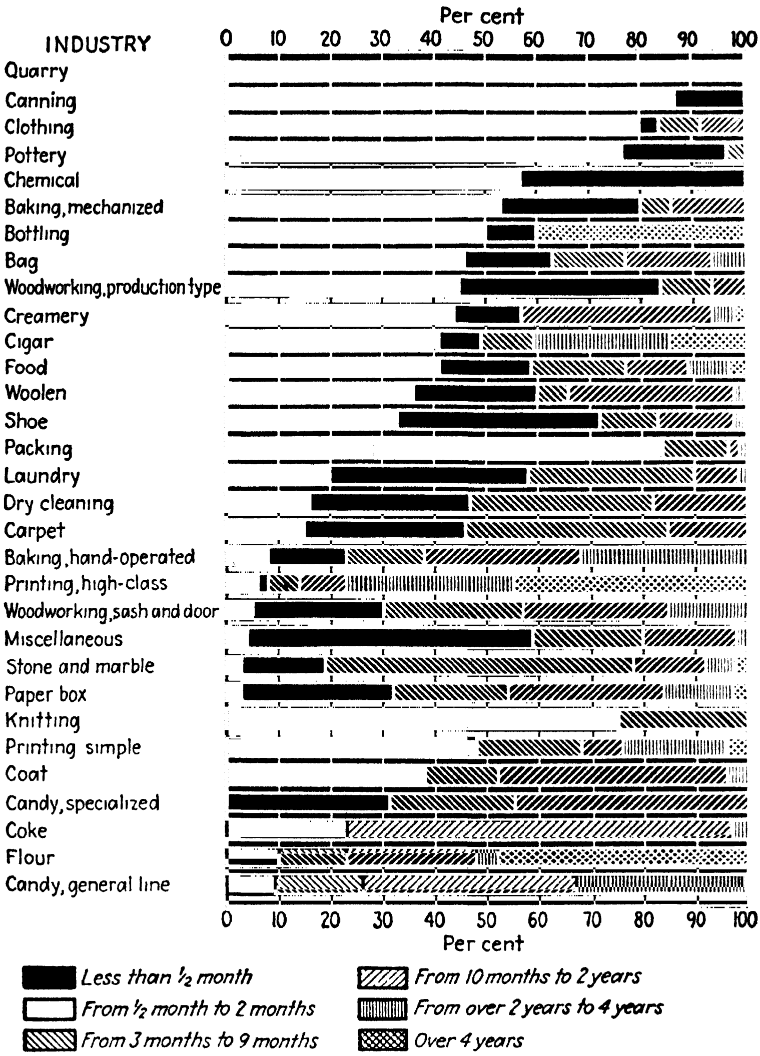


FIG. 10.—Length of time necessary to train factory workers, expressed in percentages of operations. (*After Koepke.*)

of all the operations, whereas in the hand-operated bakeries this period was sufficient for only 38 per cent."[1]

The training periods that are noted in the above two reports are the requirements under normal conditions; under the stress of an emergency,

[1] *Ibid.*, p. 20.

the habits that are essential for effective operation can be developed in a much shorter time. Plans that have been in operation in the Hartford branch of the "Connecticut Plan" and in the Thompson Products, Inc.,[1] have shown that satisfactory employees can be developed in a much shorter time than was formerly thought possible. They have shown that the shop practice period for many types of simple machine operations can be reduced by as much as 50 to 75 per cent after or during a 20-hour instruction period, properly spaced, in reading scales, calipers, and micrometers; in learning to understand signs and symbols on blueprints; in sketching, dimensioning, and detailing; and in shop theory. Qualified trainees have been taught to operate the bench lathe in 4 hours; the power saw, the drill press, the internal grinder, and the tool grinder in 8 hours each; and satisfactory bench hands have been developed in 16 hours of shop practice. Even the more difficult machine operations have been mastered in a surprisingly short time. The Connecticut Plan has shown that satisfactory workers can be trained in the following shop-practice hours: lathe, 72; surface grinder and shaper and miller, 24 each. The Thompson Products, Inc., have shown that satisfactory operators can be developed with 56 hours of class instruction and 40 hours of shop practice in the following: centerless grinder, external grinder, thread grinder, groove grinder, surface grinder, and milling-machine operator; and that in a slightly shorter time satisfactory employees are trained to operate turret lathes, automatic screw machines, and internal grinders.

The decrease in training times has been effected because of the adoption of those principles of training that have been supported by educators as essential for the acquisition of a skill. Instead of devoting a 1- to 3-year training period to entrants, the urgency of demand has forced the adoption of well-established training principles. These have been of three chief types: careful selection, proper planning of the instruction program, and care in the selection and training of instructors. Illustrations of the extent to which these principles have been adopted are found in the N.I.C.B. recent reports of company practices.[2]

TYPES OF TRAINING

The types of training offered in the interests of workers in business and industry today vary from plant to plant and from city to city. In some plants there are comprehensive programs for the development of all the force; in others, there is a limited program for the sake of beginners and an occasional conference period in the interests of foremen; while in

[1] Quick-training Procedures, *Studies in Personnel Policy*, No. 26, The Conference Board, New York, 1940.

[2] For the practices of five companies, see *Studies in Personnel Policy*, No. 18, The Conference Board, New York, 1940.

still others, there is an unorganized series of hit-and-miss attempts to introduce the novice to his job. In some plants there are specially appointed instructors under the direction of a training director who

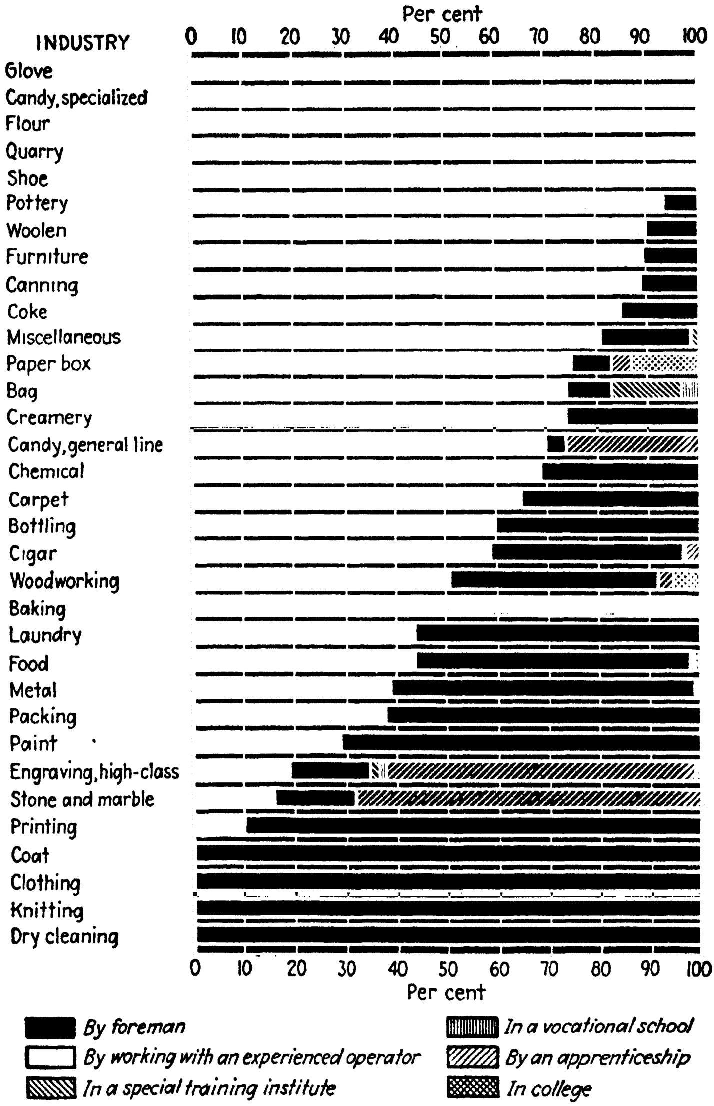


FIG. 11.—Manner in which factory workers were trained, expressed in percentages of operations. (*After Koepke.*)

is responsible for all instruction; in others, the foremen or older operators are responsible for all the training; while in others again, the novice is "shown how" by the person whose position he is to fill.

In some cities there is close cooperation between the industrial and business program of training and that offered by vocational and commercial schools or by continuation schools and universities; in other centers there are centrally established institutes, under the direction of the local educational and industrial units, which take care of all the training demands of the district; while in others there is no relation between industrial and business demands on the one hand and commercial or trade school training on the other.

The most common type of preparation for the business world is found in private or public educational institutions; upon these the majority of concerns depend for their help. Occasionally, some of the larger organizations, especially the insurance companies, supplement or even replace that by an extensive and well-organized training program. In the industrial world, on the other hand, the majority of training is done on the job, with a very small percentage carried on in trade and vocational institutes and in specially organized training institutes. The extent to which the different practices are followed is indicated in the following chart, which was compiled by Koepke from the same industries that are reported in Fig. 10.

A study of the chart in Fig. 11 will show, as Koepke points out, that

> the apprenticeship system of training today is almost obsolete. Only 144 operations, or about 4 per cent of the 4,133 operations surveyed, were taught by this system . . . training by vocational or trade schools has supposedly replaced the apprentice system, but during the survey only two operations were found for which the workers had been trained in a vocational school . . . on the other hand, 2,076, or 50 per cent of the 4,133 operations, were taught by foremen, and 1,591 operations, or 39 per cent, by experienced operators.[1]

The frequency of the practice indicates the importance of the different methods.

Training on the Job

Whether in organized or unorganized form, this type of training is the most frequently practiced today. Estimates of its frequency go as high as 75 per cent. The number of answers to the questions reported in Table 57 indicates a frequency even greater than that. B. F. Field sent a questionnaire[2] to 700 industrial organizations, 326 of which replied. The frequency of some of the practices is given in Table 57. In the study reported by Koepke, 89 per cent of the 88 firms that reported their study methods gave some form of training on the job as the kind most frequently used.

[1] Koepke, *op. cit.*, p. 23.

[2] Field, B. F., Industrial Training, *Personnel*, 7: 57–64, 1930.

TABLE 57.—COMPANY TRAINING PRACTICES
(After Field)

		Yes
A.	Does your company carry on systematic job training?	113
a.	If so, is this carried out on the job?	109
b.	Is it carried out in a special location or at special hours?	31
c.	Is the training conducted by an instructor other than the employees' foreman or department head?	59
d.	Is the training carried on by full-time instructors?	39
e.	Is the training carried on by foremen, line executives, or other line employees?	98

Training on the job is usually conducted by one of three groups: experienced operators, foremen or other line executives, or specially appointed instructors. In any of these groups the beginner is put directly on actual work, using the same tools and machines and working up the same stock as a regular producer. Production starts as soon as training starts. It is generally assumed that there will be a more or less prolonged below-average production period and much spoiled material, but it is hoped that the increased interest and pride in work and the experience of being "right in the firing line" will speedily correct any mistakes that are incident to the training period.

As a method there can be very little question about the merit of training on the job; its customary object is to prepare beginners for specific jobs that are not regularly filled by experienced workers; working at the actual task is commonly acknowledged to be the best preparation for doing the job efficiently. Leffingwell says,[1] "It is without question the most effective plan to do the training; the worker deals with realities, realizes he is taking part in the actual work of the company, sees other workers doing the same kind of tasks and is spurred on to equal them, and forms habits easily and directly because he sees their necessity and value "

Working on a job is, however, no guarantee of the beginner's accurately, successfully, or speedily acquiring the technique that the job demands. Unless the introduction is planned carefully and the successive steps are developed in keeping with the absorptive capacity of the worker, the "project method," as this type of learning is usually called, can be even more confusing than the lecture method. For its successful operation the following steps are essential:

1. The job should first be analyzed, not only for the sake of discovering how it should be done, but also for its teaching content, so that the person responsible for guiding the beginner is familiar with

[1] LEFFINGWELL, W. H., Training Clerical Workers on the Job, *Handbook of Business Administration*, ed. by W. J. Donald, pp. 807–813, McGraw-Hill Book Company, Inc., New York, 1931.

the required knowledge, skills, and personality characteristics. On the basis of that knowledge there should be standard practice sheets for each job; and they should give in detailed form the requirements of each job, arranged in their approximate order of difficulty. An illustration of that type of analysis is given in Table 58, an instruction sheet for drivers of heavy trucks, used by the Dennison Manufacturing Company.[1]

TABLE 58.—INSTRUCTION SHEET
(After Dennison)

TRUCKING HEAVY LOADING

Name__________________ Date hired__________________
or
Job__________________ Transferred__________________
Department__________________

1. Kind of truck:	
a. Lift	
b. Stevedore (#2 or #3)	
c. Flat	
d. Kendall	
e. Bin	
2. How to care for and grease	
3. How to load	
4. How to lift a balance	
5. How to truck the load	
6 How to use a hook	
7. How to handle an arbor	
8. How to use a block and falls	

Remarks:

Items checked have been taught this man and I consider him qualified.

Signed__________________
Instructor.

Safety

1. Do not lift too heavy a load without help.
2. Do not push a truck. Pull a truck behind you.
3. Do not run around corners. Someone may get run into.
4. Do not leave a truck in an aisle lying down. Stand a truck up so people will not fall over it.
5. Carry a hook in a safe way as you have been taught.
6. Go to the clinic with any injury, no matter how slight.

Don't take chances.

I have read the above rules carefully and have had them explained to me. I understand them and will do my best to live up to them.

Signed__________________
Employee.

2. The successive phases of the job should be arranged in order of learning difficulty, and introduced only when the preliminary steps are mastered and the need for additional progress is realized. Each phase should be demonstrated, and the demonstrations repeated until the beginner shows, by his questions and answers, that he is ready to try the process himself. Trial efforts, especially in moderately complex jobs, should be part by part rather than by the whole method. The beginner can grasp the whole operation and should be given a view of it; he should undertake mastering the elementary part only when it is seen

[1] DENNISON and KEIR, *op. cit.*, p. 47.

in its relation to the whole. The mastery of these elementary parts should be bit by bit.

3. The mistakes should be corrected one at a time by demonstration and further explanation, and the correction should be continued until the series of acts that the process requires is formed into a habit.

4. The guide should follow up the development of the habit and acquisition of the necessary skills so that the beginner functions at his maximum efficiency—his physiological limit. This can be acquired only when the successive movements or operations are developed in rhythmical form and reduced to "the effortless custody of automatism."

Training by the Experienced Operator.—Of the three persons with whom the beginner is most likely to work, the one to whom he will commonly be assigned is the experienced operator. Field found 50 per cent of the job training conducted in this manner, and Kenagy reports, "Our plan is to place the new employee on a given job under the personal instruction and supervision of an experienced worker on the same job, giving to the experienced worker instructions as to the training to be given."[1]

It is the form of training suggested by the Gilbreths—the famous three-position plan, in which every employee is responsible for one job, learns another, and teaches another. The experienced operators are sometimes selected because of their interest in teaching others and their aptitude for imparting what they know. When carefully worked-out instruction sheets are provided and the operator has "the teaching art," and the new employee is chosen because of his aptness for the particular type of work, the method is effective. When, on the other hand, the selection of the experienced operators is made indiscriminately, simply because they are filling a job which will require additional workers, the assistance the beginner is given is reduced to observations he makes and "bawlings out" he has to take.

For this method to be successful the following three conditions are essential:

a. The experienced worker should be interested in and know his understudy, and be able to teach the task in terms of the beginner's absorbing capacity.

b. Care should be taken in the selection and training of the experienced operator, ensuring his knowledge of the training needs of the beginner and the correct methods of imparting, demonstrating, and checking the necessary information and skills that each job demands.

c. Incentives for teaching should be provided, so that the older worker will regard his work, not as additional responsibility, but as, at least, an honor.

[1] Kenagy, H. G., The Technique of Training on the Job, *Handbook of Business Administration*, ed. by W. J. Donald, pp. 1216–1230, McGraw-Hill Book Company, Inc., New York, 1931.

Training by the Foreman.—Training under a foreman or supervisor is a frequent practice in smaller organizations and in business offices. Selected supervisors are given the responsibility of "breaking in" new clerks and salesmen, and specially appointed foremen are trusted with the responsibility of showing beginners "how it is done." The method of learning is essentially the same as that under the direction of an experienced operator and is exposed to the same hazards, except for the fact that the foremen are likely to be appointed because of their capacity to teach others. This is an essential qualification of supervisors in communication companies. When well-trained supervisors are supplied with specification sheets and some form of process charts, the chances the beginner has for getting systematic instruction are increased.

Training by Special Instructor.—Some companies offer, as a substitute for training by foremen or operators, training by a special instructor. The difficulty of getting experienced operators who are capable of conducting training successfully has led to this expedient—employing persons chosen primarily because of their ability to teach. Usually such instructors meet the beginners in a group at regular or irregular intervals, and supervise their training on the job after having familiarized them with the job demands in sketch or pictorial form. Such instructors are more likely to be successful during their own learning period than they are after they have assimilated all there is to be known about a job. Possibly the worst kind of instructor is the person who is so familiar with his job that it becomes automatic; he often does not realize the difficulties a beginner has in acquiring a skill, is likely to have very little patience with a novice (especially when he has repeated the instructions frequently to others), and tends to interpret lack of progress as lack of ability or just pure cussedness.

Training for the Job

This method differs from training *on* the job in a number of ways. It is usually given for the sake of future possibilities rather than in the interests of immediate demands; it is usually under the control of a central agency, the personnel or industrial or training department; and it is usually centralized, if not in one place for the whole plant, at least in one center for each type of training. Of this type of training there are three commonly accepted forms—vestibule schools, company schools, and apprenticeship systems.

1. Vestibule Schools.—These are usually organized by individual companies, located on the plant, and equipped with duplicates of certain machines used in the factory or office. Their primary object is to train the novice in one or more semiskilled operations so that he can

reach the point of production efficiency in the shortest possible time. The training period may be of short duration, for a particular type of work (in which case the school is used as a substitute for training on the job); or it may be continuous, in order to familiarize the novice with all types of machinery in the plant; or it may be intermittent according to production demands.

The advantages of such schools are: (*a*) They give management an opportunity to observe the worker under experimental conditions that approximate the shop or office situations, to discover the phase of shopwork in which the worker can be most efficient, to get some estimate of the speed with which he can assimilate new skills, and to form some estimate of his temperamental qualities, the types of situation that cause "explosions," his capacity for patient plodding, for cooperative ventures, and for "keeping his head." (*b*) They serve as an outlet for slack periods, so that some of the shop hands who are interested in acquiring additional skills may be further trained, instead of fired, when production is at a low ebb. (*c*) They provide an easy method of introducing the employee to the situation and atmosphere that the shop or office offers, and of discovering those who are likely to rub others the wrong way or to be an easy target for pranks.

The disadvantages of such schools are: (*a*) In a centralized form it is difficult to get instructors who are familiar with all the shop or office demands, and in a decentralized form, the demand is too small—unless the organization is very large—to justify the expenditure, especially when the training is limited to semiskilled jobs. (*b*) The training is usually of a rush type, preparing workers for immediate demands; it is very rarely carried on unless there is an opening for which workers will shortly be needed. In this respect it is a substitute for training on the job, devoid of the advantages that such training gives.

To be successful,[1] (*a*) the schools must be equipped with instructors who are familiar with the best teaching methods, who know the strong and the weak points of each trainee, and who are in constant touch with changing processes and techniques; (*b*) the school should be located in the plant, be equipped with machinery which is comparable to that being used in the shop or office, and be conducted on company time.[2]

2. Company Schools.—Large-scale organizations make it impossible for foremen or supervisors to assume the responsibility of individual training. Since the latter part of the nineteenth century, this condition has been recognized, and it has been met in a number of ways. One fairly common practice is the organization of "corporation schools,"

[1] See LEFFINGWELL, *op. cit.*, pp. 807–808, for a good appraisal of vestibule schools.

[2] For a description of vestibule schools see H. E. BURTT, *Psychology and Industrial Efficiency*, pp. 54–57, D. Appleton-Century Company, Inc., New York, 1929.

which assume all responsibility for the training needs of the company and which are under the direction of either a company official or an imported teacher. In the early part of this century, that type of school had become so popular that in 1913 the National Association of Corporation Schools was formed, primarily for the support of organizations interested in training commercial employees. Banks, insurance companies, publishing houses, department stores, security houses, and some manufacturing companies organized branches and offered training in stenography, typing, bookkeeping, retail selling, etc. The lecture method, with classroom meetings, was the most common practice, and efficiency on the job was the criterion of adequacy.

By 1919 a new type of training had gained popularity in educational circles—the project method—and the old type of company school soon fell into disrepute. In its place there was introduced the type of school which duplicates the shop and office tasks, and which occasionally supplements these with so-called cultural courses. These schools were equipped with duplicates of the machinery used in the shop, and combined practical and classroom work in alternating form. The Ford Training School represents those types that were concerned solely with the development of skills. It was organized in 1935,[1] with 25 students and 6 instructors. High school graduates with promise of mechanical ability were admitted to a 3-month training course, consisting of 2 hours of classwork a week and the balance of the week in the shop. During that time, both student and instructor have an opportunity to discover the type of shopwork that is most suitable; and the student's progress indicates whether or not the company is justified in continuing his education. The success of the plan is indicated by the fact that fewer than 1½ per cent of those enrolled fail to make the grade, and in the 7 years that it has been operating the school has grown to an enrollment many times the number with which it started.

A different and more inclusive type of company school is that organized by the Pittsburgh Division of the Westinghouse Company.[2] Their elaborate educational program takes on the form of a university curriculum, with semester courses for the average worker, the university graduate, and the foreman. For beginners the 1937–1938 season offered two types of courses—cultural, including popular lectures, educational movies, and public speaking; and special courses in new developments in Westinghouse, insulation and insulating materials, tests and performance of metals, and courses in elementary French, German, and Spanish. In addition, there is a technical night school, attended by over 500

[1] Fleet, F. A. V., Training Schools, *The Iron Age*, July 22, 1937, pp. 34–35.

[2] Westinghouse Educational Program, *Bull.* issued by the Westinghouse Club, Pittsburgh, for 1937–1938.

beginning employees, in which elementary training is offered for all the simpler trades and for selected office positions,

Somewhat similar forms of training are available now in most of the larger organizations. The experience of the Baltimore and Ohio Railroad is representative of a trend that has been developing within the past few years, *viz.*, the centralization of training. Previous to 1922, their apprentices and beginners were trained in 11 different shop schools. This system was abandoned because of the lack of coordinated effort among the different schools, the inadequacy of the training program offered by the smaller shops, and the lack of serious interest on the part of those directing and those taking the studies. In 1925, a centralized educational program was introduced in which a 3-year program was planned, with alternating class and shop assignments, definite grade levels, specific promotional standards, and a body of carefully selected instructors and supervisors who were responsible for the preparation of each student and the maintaining of company standards.

Today, company schools are a necessary part of an industrial organization, and they give every promise of meeting a need that is felt most acutely when skilled labor is at a premium.

3. Apprenticeship Systems.—Apprenticeship, the oldest and most often tried training system, has fluctuated, during the years, between the extremes of popularity and scorn. Whereas at one time it was the only recognized training method, at another time it was associated with serfdom and the sacrifice of freedom. To some it has meant an indenture system and an assured trade, while to others it has meant the sacrificing of from 3 to 8 years in comparative poverty, at the end of which there is neither guarantee nor adequacy.

The extremes that have customarily been attributed to the system have moderated somewhat during the past two decades, and modified apprenticeship systems are finding their places in industry with increasing enthusiasm on the part of their sponsors and participants. They are returning in one of three forms:

a. As a cooperative endeavor between industry and trade or vocational schools. In this form the school "lets out" a group of apprentices to a particular industry for part of the training, and provides the classroom and technical work in its regular class sessions. Sometimes the apprentices divide their time equally between the industry and the school, and at other times the schoolwork is completed "after hours." In return, the industry assures the successful apprentices of a minimum wage during the training period and work of the type for which they have been trained when the training period is complete.

b. Others regard apprenticeship training as a task too large for industry to undertake, and delegate the responsibility to specially appointed

local groups, who are responsible for training all the apprentices that local industries are likely to need. Frommelt says:[1]

> Apprenticeship generally can no longer be a matter of a complete training program contained within the confines of one plant. It must rather reach out and embrace an entire district. All the plants of one trade or related groups of trades must be drawn together under one organization. Their schedules of school and shop training must be so dovetailed that they will form an adequate program for all its plants, no matter what their size. Industrial districts . . . can present, if necessary, a program of training as rich and varied in content and possibilities, limited only by the diversity of industrial activities in the districts themselves.

And again,

> It is an utter impossibility in the vast majority of smaller plants to lay out a complete training program. Unless these plants for purposes of completely rounded out schedules be linked with the larger plants in carrying out this work, it is futile to expect them to contribute anything to the trained personnel necessary in the average American industrial community.

The best illustration of this type of training that is available today is organized under the direction of the Rochester Athenaeum and Mechanics Institute. The Rochester industries, each with apprenticeship selection methods, choose a number of entrants annually and entrust their training tc those in the institute who have cooperated in making the selections and who know the training needs and requirements of the different industries. The movement that this form of training represents is gaining momentum annually and is now sponsored by a number of state vocational education boards.

c. The third type of apprenticeship training is that undertaken by private industries. In some industries it is not practiced, while in others it is quite common. Koepke reports[2] that 65 per cent of the training in the high-class engraving and the stone and marble industries is conducted by this method, whereas in the shoe, pottery, furniture, and canning industries, it is not in use in any form. In reply to the questionnaire sent out by Field,[3] the percentage conducting different types of apprenticeship training is given in Table 59.

Table 60 gives the result of a recent survey of 473 companies, made by the *Monthly Labor Review.*[4] More than 57 per cent of the companies

[1] FROMMELT, H. A., Management Principles of Apprenticeship, *Industrial Management*, 49: 206–207, 306–308, 1925.

[2] KOEPKE, *op. cit.*, p. 23.

[3] FIELD, *op. cit.*, p. 60.

[4] *Monthly Labor Rev.*, 46: 101–103, January, 1938.

TABLE 59.—APPRENTICESHIP TRAINING IN 326 INDUSTRIES
(After Field)

		Yes
A.	Does your company conduct apprenticeship training?...	167
a.	If so, is this "on the job"?....................	163
b.	Is it conducted in a special location or school?......	59
c.	Is the training carried on by full-time instructors?...	50
d.	Is the training carried on by foremen or other line employees?..............................	148
e.	Is it carried on by foremen only?................	49
f.	Does your company train apprentices by the pickup method?..................................	51
g.	Is the training definitely scheduled as to assignment period?.................................	118
h.	What is the total length of the period?............	1 week to 7 years
i.	Is there related technical instruction?.............	101

TABLE 60.—APPRENTICE TRAINING IN 473 COMPANIES

Industry	Number of companies	Apprentice training program			Number of apprentices in training
		Regular	Occasional	None	
Agricultural implements...........	11	5	1	5	99
Autos and parts..................	28	16	4	8	540
Chemicals........................	1			1	
Electrical manufacturing...........	55	33	4	18	991
Iron and steel....................	19	10	1	8	292
Leather and its products...........	4			4	
Lumber and its products...........	3	1		2	14
Machines and machine tools........	146	92	3	51	2,392
Metal products....................	159	94	7	58	1,685
Paper and its products............	7	2		5	32
Printing.........................	4	2		2	18
Rubber...........................	3			3	
Textiles.........................	13	3		10	562
Miscellaneous....................	14	10		4	346
Public utilities..................	6	4		2	351
Total............................	473	272	20	181	7,322
Per cent.........................	100	57.5	4.2	38.8	

had regular and systematic apprenticeship training programs, distributed as shown in the table.

Approximately 99 per cent of these companies stated that training was carried on on the job, 80 per cent of them had a definite policy for the training of their workers, and 8.5 per cent of them had vestibule schools.

The frequent occurrence of any one of the three forms of the apprenticeship system in use today indicates how necessary it is to understand the way in which the system is conducted. Instead of a description of "ideal" systems, a brief account of three that are operating and some estimate of their value will be given. Before these are presented, it is necessary to state the reasons for the careful selection of apprent ces. No training can be adequate with material that is impossible, and the material cannot be chosen without knowing the nature of the object for which the choice is made. Therefore, the first thing necessary is to make a job analysis of the training demands of the different types of work for which students are to be trained. Adequate selection is possible only when the job to be mastered is understood. Then there must be adequate tools for measuring the candidates in terms of the demands of each skill or craft. Only when there is adequate selection technique can one avoid the hit-and-miss method of admitting apprentices and make satisfactory progress during the training period.

Selection methods are usually in terms of trade or office demands. Information tests are the most common tool; interest questionnaires are occasionally used; capacity tests are rarely used. The practice, adopted by some business colleges, of requiring a certain level of promise as indicated by a clerical test, is finding its way into some trade schools and industrial organizations. As a rule, the tests that are used are peculiar to the industry, but occasionally such tests as O'Rourke's, Stenquist's, and the Minnesota are included in the battery. When tests of this kind are used, the critical scores are in terms of trade demands, instead of in terms of established norms.

THE CONTENT OF APPRENTICE TRAINING COURSES

What should be the content of apprentice training? The content, of course, is determined by the objective. The danger in modern apprentice training is the failure to provide a definite objective, a definite training period, definite standards, a set course of instruction, and mutually agreed-upon obligations. If these dangers are avoided, the training program should include the theoretical and scientific principles involved in the craft, any necessary mathematics, blueprint reading, the nature and use of tools, and extended practical experience.[1] The following brief descriptions will indicate how some operate.

1. *The Folk Apprentice System*[2] is under the direction of an apprentice organization that operates independently of the production department. A systematic course of work and study is organized and placed in the hands of a competent corps of instructors and foremen. After a period,

[1] FROMMELT, *op. cit.*, p. 365.
[2] *Ibid.*, p. 367.

varying from 6 to 12 months, the apprentices are placed in the charge of foremen in different departments; and after a second period, they are recalled to the instructional division for more advanced courses. When these are completed, the apprentices are routed to different departments in which there are operations similar to those that they have assimilated. Thus the academic work and shopwork alternate until each apprentice is familiar with the essential elements of each trade. During the training period a local vocational school is responsible for designated academic work, and at least one half hour per week is devoted to personal conduct problems, which may vary from such topics as shop conduct to principles of thinking and from that to taxation. Monthly reports of progress are given, and the rate of pay, beyond the initial base rate, is determined by the speed of progress.

2. *The Dinta System*[1] (The German Institute for Works Training) was organized in 1926 by Herr Arnhold, chief engineer of the Schlaker Steel Works. The object of the system is to provide a suitable training for selected boys who wish to become skilled craftsmen in the engineering, mining, building, and textile industries. Each branch of the system operates in, and is financed by, one industry, under the direction of a specially trained Dinta engineer, who selects the apprentices and supervises their social and physical welfare besides directing their workshop and trade school training. The system has three features:

a. Selection and placement are made by means of an elaborate testing system. Each trade is analyzed, and tests have been devised which are based upon these analyses. The most commonly used tests are for memory, general intelligence, manual dexterity, color blindness, and capacity to think in three dimensions. The test results determine whether or not the applicant is to be admitted and what trade he is to be permitted to learn. The most common selections are fitter, turner, molder, and patternmaker.

b. Two years are spent in a special workshop, and during that time the appentice spends 1 day per week in the works school receiving instruction in mathematics, mechanics, workshop processes, technical drawing, and citizenship. The remaining 2 years are spent in the regular shop at types of work selected by the Dinta engineer.

c. Throughout the 4-year period emphasis is placed on social and physical education. Social clubs, concerts, special lectures, and organized sports form part of the prescribed program.

3. *The Apprenticeship System of the Carnegie-Illinois Steel Corporation* has the following features:[2]

a. Terms of apprenticeship. (1) Each applicant must be at least eighteen years of age, better than average physically, sound mentally and morally, and must be a high school graduate or its equivalent. (2) For all trades apprenticeship lasts eight

[1] CURRIE, J. H., The Dinta System, *Jour. Nat. Inst. Industrial Psychol.*, 6: 122–126, 1932.

[2] Bulletin entitled *Apprentice Training*, issued by the Industrial Relations Department of the Carnegie-Illinois Steel Corporation, November, 1936.

6-month periods, a total of 8,320 working hours. Any of the following trades are studied: blacksmith, boilermaker, bricklayer, electrician, machinist, molder, patternmaker, pipe fitter, roll turner, tinsmith, welder. (3) A foreman and a coordinator or assistant director supervise the progress of each apprentice, and follow a printed set of training specifications for each trade. (4) Classroom work for 4 hours per week, in subjects related to the trade, is provided either at the plant or in cooperation with local schools, and from two to twelve inspection trips to parts of the plant or to other plants, under the direction of a foreman, are provided annually. (5) Pay for the first period is 90 per cent of common labor, and that increases gradually to 140 per cent at the end of the eighth period. The pay also includes any benefit in the form of general pay increase in which the whole force may share, as well as any returns from individual use of incentive plans.

b. Types of training. Three kinds of training are offered: (1) Shopwork. Definite work for each of the eight periods is planned. The boilermakers, for example, during the first period are assigned to "work in toolroom, learning names of tools, their use, care and maintenance; work as rivet heater to learn methods of heating, both electrical and with forge; work in riveting gang, bucking-up on various classes of work; and work with cutting torch to learn fundamentals and proper method of operation"; and during the eighth period the same students "work on field erection of structural steel; work on general boilermaker work previously covered; and work from drawings." (2) Classroom work with such subjects as trigonometry, sheet-metal drawing, boilermaker technology, templet design, mechanics, etc. (3) Shop talks on a variety of subjects, from "how to help a boilermaker" to "proper methods of punching and riveting" and "expansion of metals and precautions to be taken," etc.

The value of such apprenticeship systems depends upon the care with which they are organized and the systematic follow-through that is practiced; unless there is a verbal or a signed agreement between employer and apprentice, the system very readily falls into disrepute, especially when there are not set standards that must be met at the end of definite periods, or when there is an unusual demand for semiskilled work at which the apprentice is kept for an unwarranted length of time, or when coordinators or foremen lack the capacity to take an individual interest in each apprentice and fail to keep him at increasingly challenging work. When the apprenticeship is properly organized, the results are gratifying. "The experience of the Westinghouse Electrical Company indicates that at least 40 per cent of its graduated apprentices eventually become members of the company's supervising force, and the labor turnover for graduated apprentices . . . is only 3 per cent."[1]

During the past 10 years apprenticeship training has received new impetus because of the establishment, in 1936, of a permanent Federal Committee on Apprenticeship Training. This committee has directed and cooperated with state and local committees in setting up standards for admission to apprentice schools, in formulating training programs, and in sponsoring training agreements between the company and the

[1] SELLS, DOROTHY, Apprenticeship, Its Status and Possibilities, *Industrial Management*, 71: 278–283, 1926.

apprentice. The minimum standards that have been established have been summarized by Scott[1] as follows:

a. The minimum age of an apprentice shall be sixteen years.

b. The training period shall not be less than 2,000 hours nor more than 10,000 working hours.

c. Initial wages paid the apprentice shall not be less than 25 per cent of the wages paid journeymen.

d. Not less than 144 hours of instruction under public authorities must be provided.

The content and manner of instruction of such training courses have shown marked changes since this committee was organized; instead of limiting training to job demands and to the hit-and-miss process that mere observation and trial-and-error practice produce, many companies have developed apprentice training programs that are in advance of many offered by city trade schools. An illustration of some of these programs is given in a recent survey made by the N.I.C.B.[2] of the practices in five companies. A summary of the content of such courses is given in Table 61.

TABLE 61.—CONTENT OF APPRENTICESHIP TRAINING COURSES[1]

Content	Method used	Leadership	Duration
Shop experience	School shops	Apprentice supervisor and staff	1½ to 2 years
Correlated theory	Night schools	Apprentice staff or local trade school staff	4 to 7 hours per week for 2 to 5 years
Theory of machine-shop practice	Classes in company or at school	Staff of company or local school	2 hours per week for 2 years
Plant experience[2]	Series of jobs in plant	Company supervisors	1 to 5 years
Company organization	Discussion groups	Department heads	1 hour per week

[1] *Studies in Personnel Policy*, No. 18, pp. 8, 23, 35, 44, 53, The Conference Board, New York, 1940.

[2] The plant experience usually includes two types of training, one for "learners," lasting from 2 to 3 years, and including such operations as lathe work, milling, grinding, drill-press operating, and bench-work; and one for apprentices, lasting from 2 to 4 years, and including such operations as toolmaking, tool design, metal patterns, foundry work, screw machines, modelmaking, and general mechanics. Frequently the training is limited, as in the Ford school, to one of the trades.

Apprenticeship training programs have dwarfed all others in the amount of recognition that has been given them by industry, the sponsorship that they have received through the passing of the Smith-Hughes and the George-Deen Act, the demands that their introduction has placed

[1] SCOTT, W. D., R. C. CLOTHIER, S. B. MATHEWSON, and W. R. SPRIEGEL, *Personnel Management*, 3d ed., p. 282, McGraw-Hill Book Company, Inc., New York, 1941.

[2] *Studies in Personnel Policy*, No. 18, The Conference Board, New York, 1940.

on companies for developing instructors, and the manner in which the primary elements in good instruction—proper selection, logical planning, and well-trained instructors—have been found essential and profitable; they have placed new demands on both industrialists and educators, and have given new emphasis to the place that well-constructed selection tests can fill in industry.

FOREMAN TRAINING

The primary essential of effective foremanship is job experience; no one is in the position to plan and direct the work of others without knowing the types of work that must be done, the manner in which they should be done, and the way in which their performance may be impeded. Industry has recognized this necessity and has rarely placed a person in the foreman's position without being assured of his having had experience "down the line."

In assuming that responsibility, the foreman is confronted with many problems that have but little relation to job experience, and in consequence he has had to become familiar with new tools and arts that are far removed from the mechanical skills that were demanded by previous experience. The nature of these new demands has been well expressed in a recent report issued by the N.I.C.B.:[1]

> The difference between an executive and a foreman is coming to be more a question of the extent and amount of responsibility than of the kind of responsibility. Each executive and foreman, to the extent that those factors are related to his work, is expected to be familiar with the organization, the operating policies, the personnel policy, the productive process, the distribution system, the clerical routine, the quality of the product, and the cost of materials, machines, and operations.

The necessity of familiarizing foremen with these phases of the organization has compelled management to institute foremen training programs; foremen must know their companies from an organizational as well as from an operational standpoint if they are to assume managerial responsibilities.

But it is not only in the capacity of manager that a foreman functions. Van Wyck lists[2] the three major divisions of foremen responsibility as managerial, supervisory, and training. As manager the foreman must plan every phase of the job—the tools, equipment, supplies, and material that are to be used; the procedures to be followed in successive operations; the standards to be maintained; the checks to be used; the safety practices to be observed; and the personnel to be employed in those parts of the

[1] *Studies in Personnel Policy*, No. 15, pp. 70–72, The Conference Board, New York, 1939.

[2] PROSSER and VAN WYCK, *op. cit.*, pp. 12–14.

job where individual training and experience will be most effective. As supervisor, the foreman must see that others carry his plans into effect and adhere to the procedures, standards, and precautions that have been established; to that end he ensures the adoption of adequate safety measures, the avoidance of waste, a reduction of cost to the minimum, and systematic checkup of the finished product. As trainer, the foreman helps select those who are to be trained, helps plan the training program, sells the program to the employees, uses those of his force who can train others to assist in the training, and constantly hunts for new and speedier ways of bringing trainees to a normal production level.

In order to meet these major demands the foreman needs guidance and training in human and job relationships as well as in company organizational problems. He needs to be familiar with the majority of tools that are in constant use by the management engineer—the how and why of motion study, the way in which a job may be analyzed, the factors underlying wage rates, and the principles that govern the flow of work. He needs also to be familiar with many of the tools of the psychologist—the method of matching men and jobs, the art of eliciting the best efforts and the cooperation of others, the way to analyze and settle grievances, and the time for, and type of, rewards that will enhance loyalty to the organization.

Both management and government are aware of these new responsibilities of foremen and supervisors, and have, in many places, installed procedures for selecting and training foremen. Both management and government recognize that preliminary to any training program must be the establishment of objectives; and as a prerequisite for the attainment of these objectives there must be wise selection of those who may be capable of attaining the goals. Awareness of the importance of such selection has been responsible for the multiplicity of lists of qualities and abilities that foremen should possess. They should be in the upper half, and preferably in the upper third, of the adult population in intelligence. They should be good planners and organizers. They should be charged with enthusiasm, and yet have their emotional energy constantly under control. They should be able to trust others with responsibility and recognize merit in others, and at the same time they should be neither gullible nor suspicious. They should be recognized as leaders in other situations than their work relations; and they should be always on the *qui vive* for opportunities for improving themselves, their workplace, and the employees for whose work they are responsible. In brief, they should exhibit the qualities of fairness, firmness, reliability, tactfulness, cooperativeness, and initiative.

The demands that are placed on foremen today have long been recognized by some as their responsibilities. As far back as 1913, Thoma-

son,[1] of the Rochester Mechanics Institute, interviewed a number of foremen in different companies in order to find out what they regarded as their responsibilities, and classified his findings in four groups, as follows:

a. General. The commonly accepted responsibilities of foremen—knowing department rules and enforcing them, setting an example for others in behavior and care over company property, accepting and promptly carrying out orders, and cooperating with other depa tments when the situation arises.

b. Technological. Keeping machines, tools, safety devices, and equipment in proper condition; inspecting and recording the raw material or the finished product and properly storing it; planning ahead for the most efficient use of men and tools; helping develop standards for selecting and testing materials; and offering suggestions for improving processes, designs, and equipment.

c. Economic. Conserving power, gas, light, water, raw material; keeping records and making reports of attendance, complaints, shortage, etc.; supplying time and cost data to the planning, accounting, and personnel departments; holding up questionable work and enforcing company standards; and arranging work in their own departments so as to avoid confusion and make the most efficient use of equipment.

d. Personnel. Interpreting management to men by explaining company policies, incentive systems, safety and welfare programs, and by clarifying published statements; representing men to management by presenting their views, capacities, and attitudes in an unbiased manner; helping the training program by encouraging participation and by selecting the more promising men for special training; cooperating with the employment department by giving exact specifications when men are needed, and with the personnel department in rating each man and in selecting those worthy of promotion, and with the safety department in enforcing rules, reducing accidents, and in maintaining first aid facilities; maintaining discipline in a manner which will ensure the cooperation of all workers; and in improving their own efficiency by constant study, participation in conferences, and visits to other divisions.

Again, in 1927, Houser[2] interviewed over 100 foremen in order to find out the aspects of their job on which they felt they were falling down and on which they needed help, and listed his findings under the following heads:

The nature of company policies.
Handling men.
Relationships with other companies.
Record keeping.
Training others.
Supervising those who were on his work level.

The other-than-production problems and responsibilities that are thrust on foremen, and that have been recognized by a small percentage for some time as part of their duty, are brought into the limelight today because of the pressure that has been placed on management by the

[1] THOMASON, C. C., Foreman Job Analysis, *Personnel*, 8 (No. 1): 11–15, 1913.

[2] HOUSER, J. D., *What the Employer Thinks*, Harvard University Press, Cambridge, Mass., 1927.

growth of unionism and the acceptance of collective bargaining as an established means of resolving differences between employers and employees. Spurred on by these pressures, companies, educational institutions, and governmental agencies have inaugurated foremen training programs in such numbers that the number of foremen in training today is surpassed only by the number of apprentices.

Methods Used in Training Foremen

The methods that have been used in such programs have varied from company to company. They are, however, all variations of the following seven types:[1]

1. Incidental or Emergency Conferences.—Usually such a conference is called because of some problem that demands immediate solution. This is especially true when sources of conflict arise between management and men, and foremen are consulted to find out the causes of friction and to suggest plans of procedure. These conferences are necessarily educational, as in them management must disclose attitudes, but they are rarely spontaneous. Freedom of discussion is noted for its absence; and compromises are dictated rather then evolved.

2. Distribution of Circulars.—Periodic news bulletins are sent to officers, apprising them of new developments, new policy changes, or new plans for caring for current problems. This is a one-way type of education, and lacks the personal contact, and is customarily regarded as "an order from higher up."

3. Cooperation with the Employee-representation Plan.—In this system there are joint meetings of the supervisors and the foremen, in cooperation with employee representatives, to discuss selected or suggested topics. The topics are usually suggested by the employees and may range from principles of personal leadership to production methods. The difficulty with this plan is that, while it permits free interchange of ideas, it is very rarely concerned with issues that are of immediate importance. The primary purpose of such discussions is to solve employee, rather than company, problems.

4. Line Supervisory Contacts.—This is really a substitute for the circulation method. It is concerned with passing along information regarding company policy or innovations. The manager calls in the superintendents; each superintendent calls in his foremen; each foreman calls in his group leaders; and each in turn distills information in more or less accurate form "down the line." The system is a one-way telephone call with no rebound.

[1] See Humke, H. L., Types of Foreman Training, *The Society for the Advancement of Management Journal*, 2 (No. 5): 143–148, 1937, for a more thorough discussion of these training programs.

5. The Lecture System.—This may be conducted by an executive, an imported educator, or an elected officer, or by a number of selected authorities. Usually there is a live topic for discussion, and in many cases the latest available information is disbursed to the group. The meetings are often held after hours and no record is kept of anything but attendance; frequently even that is omitted. The classroom atmosphere prevails, and the audience listens (sometimes), and rarely contributes either information or questions. The evils of this system have been summarized by Ford[1] as follows:

a. The lecturer too frequently does not adapt his language expression to the needs of the audience. It is therefore not understandable.

b. The material is generally presented with too much speed for thorough mental digestion.

c. Obscure and poorly understood points are not given adequate explanation, and the employee has no chance to voice his difficulty at the time of the misunderstanding.

d. The foremen usually regard the lecturer as an impractical theorist and are inclined to scoff at the information he is giving. The "white-collar" man is distinct from the "workingman."

e. The foremen may disagree with some of the points directly, but they have no chance to voice their disagreement.

f. Foremen are not accustomed to sitting quietly and giving auditory attention for so long an interval of time. They go to sleep or think about more interesting things while the lecturer's voice drones monotonously in the distance.

These objections against the lecture system have been so effective that the method is now very rarely used. The first organized revolt against its use was made about 20 years ago by C. R. Allen.[2] During the First World War he was given the responsibility of training men for the Emergency Fleet Corporation, and he adopted the system of dividing the men into small groups and formulating a project for discussion for each group meeting. This method, which has grown in popularity ever since, is the form of training most commonly used today. It is the system discussed in the following paragraph.

6. The Planned Instructional or Conference Program.—Usually there are carefully prepared text material, a special conference time, selected leaders who are given preliminary training for each conference, attendance records, and occasional objective quizzes. The conferences are held on company time—usually during the latter part of the morning—and attendance is obligatory, once a person has agreed to attend. Different groups of foremen discuss the same topic and the solutions, and some-

[1] FORD, A., *A Scientific Approach to Labor Problems*, p. 98, McGraw-Hill Book Company, Inc., New York, 1931.

[2] ALLEN, C. R., *The Foreman and His Job*, J. B. Lippincott Company, Philadelphia, 1922.

times mimeographed reports of the whole discussion are exchanged with other groups. The extent to which these conferences are held is indicated in a survey made by Field,[1] the results of which are given in Table 62.

TABLE 62.—EXTENT OF FOREMAN TRAINING IN 326 INDUSTRIES
(After Field)

	Yes
Does your company carry on systematic supervisory or foreman training of the men immediately in charge of the rank and file?...	129
a. If meetings are held, are they conducted by the foremen's supervisor?	86
b. Are they conducted by a staff man other than their supervisor?	53
c. Is the training material prepared within the department?....	70
d. Is the training material prepared by a company training specialist?........	42
e. Is the training material prepared by an outside organization?..	43
f. Is the training program carried out by the distribution of written material rather than by the holding of meetings?....	6

Such training programs are most effective when they are given the complete cooperation of management, when the topic for discussion has been agreed upon by the foremen, when the leaders for the different groups are carefully chosen and specially trained, and when the material for each meeting is carefully prepared. There is some doubt about the value of previously prepared material; each meeting should logically follow through with the unfinished discussions of the previous meeting; the prepared material for each meeting should be related to the discussion of previous meetings. For that reason, many companies are finding the preliminary preparation of the general outlines sufficient to start the series of conferences, and preparing the outlines for each meeting in the form of summarized reports of previous discussions and suggested outlines for continuing the same topic or starting another. The preparation of the conference leaders should be in the form of a master conference in which the different group leaders meet with the training director or one of the officers, or both, and discuss company policies as they affect the issue to be discussed. Regarding the value of such master conferences, Humke, who visited a large number of industrial plants in the interest of foremen-training programs, says:[2] "I have found foreman training most effective in those institutions which used a master conference . . . especially when the material is presented in the master conferences a considerable time prior to the date of its actual presentation in the foremen's conferences."

[1] FIELD, *op. cit.*, p. 60.
[2] HUMKE, *op. cit.*, p. 147.

7. The Determinate Discussion Method.—This variation of the conference method has been used by Beckman[1] for some years, and has suggested the pattern in terms of which Federal Defense Foremen Training programs are formulated. Beckman suggests (p. 20) that it differs from the usual conference method in the following respects:

a. Each meeting has specific objectives.

b. Each discussion is arranged in outline form.

c. Case material to illustrate points that are discussed is provided by the participants.

d. Ideas elicited during the discussion period are charted.

e. The members are provided with a predetermined outline at the end of the discussion period.

As an illustration of the manner in which the method is followed, the outline that is provided for discussing the topic Giving Orders That Are Carried Out may be summarized. Under three major divisions, the order of presentation is as follows:

a. Important Points in Giving Orders.—Here follow 18 precautions to be observed before an order is given; *e.g.*, Do not give too many orders at the one time.

b. The Use of Detailed Orders.—Here follows a discussion of the *disadvantages* of detailed orders—*e.g.*, tendency to curtail suggestions; the *advantages* of detailed orders—*e.g.*, the facilitating of training; and the *conclusions* suggested by the discussion group—*e.g.*, the times, places, and conditions under which orders are warranted.

c. When to Use Written Orders.—The various conditions under which written orders are more valuable than oral are elicited from the discussion group, *e.g.*, when it is necessary to hold the employee strictly accountable.

The popularity of this method of training foremen is an indication of its value. It is true in foreman training, as in any other project, that the greater the extent to which members participate the greater will be the gain on the part of the participants. As a method for training others this is neither a novelty nor a guarantee of adequacy. It has been the most frequently used method in university seminars for decades, and depends for its success, as similarly conducted seminars depend for theirs, upon the following factors:

a. The Extent to Which Participants Prepare for the Discussion.—Spontaneous suggestions that are given during a discussion period are rarely as valuable as those that result from a study of the factors that are related to the subject; some preparation is necessary, even for unrehearsed broadcasts. In this respect the academic seminar has enhanced its value by supplying outlines of discussions a week or so in advance, so that the members may be allowed an opportunity to give some thought, and possibly study, to the problems that are to be discussed. Some experience with foremen groups seems to justify this practice, in the place of the practice of distributing outlines at the end of the discussion period.

[1] BECKMAN, R. O., *How to Train Supervisors*, p. 305, Harper & Brothers, New York, 1940.

b. The Commonalty of Training and Interests of the Training Group.—In this respect the academic world has established a method that might well be adopted by the industrial world; *i.e.*, set up standards and qualifications for admission to the discussion group. It is as impossible in industry as it is in a university to conduct successful discussion groups with members who widely differ from one another in their training, experience, and education. The problems that are common to foremen in one type of manufacturing process are not the same as those peculiar to foremen engaged in another type, and problems that are the concern of the producer differ from those that are peculiar to the distributor. Coupled with these are such factors as differences in policies in different companies, current problems that are peculiar to one unit or to one foreman, differences in methods of settling disputes in different companies because of differences in accepted procedures, and variations in responsibility that make accepted methods in one company impossible in another. In other words, determinate discussions are most successful when the members belong to one company and are engaged in one type of work.

c. The Extent to Which a Small Number Monopolize the Discussion.—This danger has been the most common one in university seminars, and has been avoided because of the latitude that the instructor is given—a latitude that permits specific assignments and individual attention. The extent to which this danger operates in foreman discussion groups is determined by the mental and directional poverty of the trainer; given the authority that the institutional instructor has, he may easily avoid the danger.

Both the advantages and the disadvantages of this method have been summarized in a recent report of the N.I.C.B.[1]

The Content of Foreman Training Courses

The nature of the problems with which foremen are concerned and the fields with which they are supposed to be familiar are indicated in the study that has recently been completed by the N.I.C.B.[2] In a study of the training program that was in effect in five different companies the following topics were common to a number:

The problems of modern foremanship.
The layout of a department.
Machinery, tools, and equipment.
Maintenance and repairs.
Supervisory control of new materials, of supplies, and of the operating process.
Organization of the working force.
General administrative policies.
Safety and medical service.
Financial incentives.
Standards and department analyses.
Motion study.
Developing men.
Employee associations.

[1] *Studies in Personnel Policy*, No. 15, pp. 43–44, The Conference Board, New York, 1939.

[2] *Studies in Personnel Policy*, No. 15, The Conference Board, New York, 1939.

The above list is indicative of problems that are common to all foremen in one company; it does not include those that are peculiar to any one foreman. In addition to general problems with which foremen must be familiarized, there are others that are peculiar to the particular group of men supervised. General knowledge of the way to handle and develop men provides the background of information, but it does not supply the method for understanding the difficult case of the problem employee. Techniques that are available for analyzing and caring for such are discussed in the chapter The Problem Employee.

Topics for Report

1. Make a survey of the training facilities that prepare people for positions in one community; compare these with the demands of business and industry in the same community.

2. Outline a training program for any of the following: personnel director in a manufacturing plant, college graduate apprentices in a bank, customer man in a brokerage office.

Required Readings

1. Scott, W. D., R. C. Clothier, S. B. Mathewson, and W. R. Spriegel: *Personnel Management*, pp. 251–287, McGraw-Hill Book Company, Inc., New York, 1941.
2. Viteles, Morris: *Industrial Psychology*, pp. 393–437, W. W. Norton & Company, Inc., New York, 1932.

Supplementary Readings

1. *Studies in Personnel Policy*, No. 18, The Conference Board, New York, 1940.
2. Prosser, C. A., and P. S. Van Wyck: *How to Train Shop Workers*, American Technical Society, Chicago, 1941.
3. *Studies in Personnel Policy*, No. 26, The Conference Board, New York, 1941.

CHAPTER X

MOTIVATING THE EMPLOYEE

Securing employees today is not nearly so acute a problem as is enlisting their cooperation and loyalty, once they have become members of the organization. The problem of motivation is concerned, not with the task of getting workers to do assigned jobs, but with the task of enlisting their cooperation and loyalty when they have already become identified with the organization. Industry needs, and hopes to get, more than a quota of daily work from its employees, and the employees hope to obtain from industry more than the contents of the weekly pay envelope. Proper motivation of both these problems is the accepted tool for solving them.

To motivate is to cause a release of energy in relation to a desired goal. Effective motivation is determined by three factors: the goal that is to be realized, the energy that is to be released, and the tools that are to be used to direct and control that energy. The released energy depends upon the capacity and the will to work of the individual employee. The goal that business and industry hope to reach through the use of that energy varies in different organizations and expresses itself in a number of forms. At one time it may be a willingness to work at increased pace for a long period of time; at another, it may be a voluntary cut in pay; at another, a sacrificing of one's promotional possibilities in the interests of the welfare of the organization; and at yet another, apparently excessive supplementary responsibilities without any promise of immediate reward. The nature of the goal is of minor importance; the desirable state is that the attitude of the employee toward the organization be such as to make possible his carrying on these supplementary efforts as spontaneously and as willingly as if they were being made in the interests of his own home. To reach that stage in an employee's relations with an organization in which loyalty to the firm and consideration for its welfare are of more importance than temporary personal sacrifices is the goal of motivational endeavors. The whole problem of motivation is the problem of the development of attitudes, loyalties, and capacities for making sacrifices toward an entity that is of greater consequence to the individual worker than is his own job or his personal welfare. How to reach that goal is one of the unsolved problems of the modern employer.

The tools that have been adopted by business and industry to help both employers and employees reach that stage are of two kinds: financial and nonfinancial. The distinction between the two is true only for the employee, to whom some tools have immediate or remote financial gain, while others are of no obvious material value and may be substitutes for more tangible expressions of managerial endeavors. For management, on the other hand, the introduction of any incentive means so much additional expense, in time, men, or money—or in all three. To management the importance of the selected tool lies not so much in its nature as in the contribution that it will make to the accomplishment of the purpose for which the expenditure is being made. The type of tool used depends upon its cost to the organization, the probable results that its use will bring, and the number in the organization who will be affected by using it. Quite often, the type of tool selected is determined by such minor factors as the ease with which it can be administered, the temporary enthusiasm about its introduction, the frequency of its use in adjoining or competing companies, and the previous experience of one or more executives in using it.

The goal to be attained, the difficulties that have been met by other organizations in their experience with the tool, and the rebound on the part of employees if it is misused or discontinued are among the rare, yet essential, considerations that should precede the adoption of any incentive. The incentives used most commonly are of a financial nature. Those are the easiest to introduce, they generally receive employee support, and they seem to produce an immediate effect. Their ultimate value is questionable. If the object in introducing them is the development of proper attitudes, such incentives aim to accomplish that end in a shorter time than is necessary, as a rule, for developing them. Attitudes are not subject to mushroom growth; their attainment is the product of a process of development which is rarely conditioned upon simply one factor or one type of experience.

FINANCIAL INCENTIVES

On the theory that men work for money, the oldest and most widely used tool for healing the wounds of employees and reaching a desirable industrial state has been some form of financial incentive; the frequency with which this type is used is indicated by the results from a survey made by the National Metal Trades Association.[1] Of the 365 companies which were circularized, 54.3 per cent were using some form of financial incentive, and 50.7 per cent of the total employees were participating in the extra distributions.

[1] Quoted by C. W. LYTLE in *Wage Incentive Methods*, pp. 9–10, The Ronald Press Company, New York, 1929.

Major Financial Incentives

The types of financial incentive used vary with the objectives for the introduction of the plan. When the objective is the immediate stimulation of increased effort, the incentive is usually related to the production rate of the individual employee or to that of a departmental group of employees; when the objective is the fostering of morale, loyalty, and teamwork, the amount and form of the incentive are determined by the profits of the organization. Incentives in the former group are usually called wage-incentive plans; in the latter, profit-sharing plans.

Wage Incentive Plans.—The extent to which these are being used is indicated by the results from a survey made by I. C. Morrow in 1937.[1] In 133 plants, representing 50 different types of industry, 45.86 per cent were using straight piecework and individual bonus, 34.6 per cent were using a group bonus plan, and 6.8 per cent were using a measured daywork plan. Fifty-four per cent reported an increasing use of incentive plans, and 10 per cent of those not using any plan were contemplating introducing some.

The types of wage-incentive plan that are being used have increased in number and variety since Taylor introduced his differential system of wage payment. Lytle has classified those in operation in 1928 in three major groups:[2]

1. Those based on straight commission rate, or on time plus commission rate, or on piece or multiple piece rate. The plans of Taylor, Merrick, and Gantt are included in this group.

2. Those based on a day-wage guarantee, supplemented by some form of profit-sharing plan. Halsey, Diemer, Baum, Bedeaux, Ficker, Sherman, Rowan, and Barth have all suggested different types of percentage distributions which have been adopted by different companies.

3. Those based on two variables, usually a ratio between a standard rate and an acquired production rate. Emerson, Wunnerlund, Knoeppel, Bigelow, and Parkhurst have suggested forms which are in operation in different companies.

Lytle reports the day rate as the most common practice for unstandardized work, and the following plans[3] as those most commonly used in types of work in which time and motion studies have been made:

a. The Multiple Time Plan, in which there is a different rate for different production zones, the rate being determined by the unit production cost. The employee

[1] Morrow, I. C., How 133 Plants Look at Wage Incentive Systems, *Factory Management and Maintenance*, 95: 75–77, 1937.

[2] Lytle, *op. cit.*, p. 20.

[3] *Ibid.*, pp. 59–60.

producing 100 units per hour is given a higher rate than one producing 80, and the 80-unit producer a higher rate than the 60, etc.

b. The High Piece-rate Plan, in which rate per piece is determined by an average, or standard, time which has been set by time and motion studies. In 40 groups of industries, 31 per cent reported this form as the most satisfactory that had been used.

c. The Merrick Multiple Piece-rate Plan, which gives different piece rates for different production rates, but which guarantees a minimum piece rate for low producers and beginners.

d. The Gantt Task and Bonus Plan, which gives a varying bonus for different standard times and production rates.

e. The Halsey Constant Sharing Plan, in which the time saved above standard is to be divided between the company and the employee according to a predetermined scale, usually on a 50-50 or 33⅓-66⅔ basis.

f. The Bedeaux Point Plan, in which wages are guaranteed, and production beyond standard is shared on a 75-25 employee-supervisory basis.

g. The Barth Variable Plan, in which the wage rate is based on a set hourly rate multiplied by the square root of the multiple of the hours standard and hours actual.

h. The Emerson Empirical Scale Plan, in which bonus starts when the employee reaches 67 per cent of standard efficiency and increases gradually as he goes beyond that. The Bigelow-Knoeppel Constant Sharing Plan is similar to this, except that the bonus starts at 60 per cent of efficiency.

The frequency with which these plans are in use is indicated in Table 63. Column I gives the results of a survey of 149 industries employing

TABLE 63.—WAGE-INCENTIVE PLANS IN DIFFERENT INDUSTRIES

Types of plan	Number of plants using the different plans	
	Column 1 149 plants	Column 2 40 plants
Straight piecework	48	21
Taylor piece rate	1	1
Manchester piece rate	2	0
Merrick Multiple Piece Rate	1	1
Individual bonus	38	1
Group bonus	28	0
Emerson Plan	18	3
Halsey 50-50 Plan	7	1
Bedeaux Point Plan	12	3
Gantt Task and Bonus Plan	7	2
Haynes Bonus Plan	4	0
Knoeppel Efficiency Bonus Plan	4	0
Diemer Bonus and Premium	2	0
Rowan Premium	1	1
Wunnerlund Premium Plan	1	0
Estes Premium Plan	1	0
Baum Differential Gain Sharing	1	3

220,000 workers, made by Langsmer;[1] and Column 2 gives the results of a survey of 40 companies employing 152,163 workers, made by Jucius.[2]

Evidence of the frequency with which different forms of bonus plans are used is given in Table 64, which summarizes the results of five different surveys made since 1932.[3] The surveys reported the practices

TABLE 64.—COMPANIES AND WORKERS SHARING IN BONUS PLANS

Makers of surveys	Number of workers		Number of plants	
	In survey	Sharing bonus	In survey	Sharing bonus
Chicago Bureau	152,163	49,022	40	31
Langsmer	221,850	82,750	149	54
King	88,540	12,806	132	49
N.I.C.B. (*a*)	777,376	122,336	1535	248
N.I.C.B. (*b*)	4,502,608	3,712,217	2452	1827

of 4,308 companies, which at the time of the survey were employing 5,742,537 workers.

Of these five surveys the last one, made by the N.I.C.B., is the most recent; the increasing use of bonus plans shown by these results gives convincing proof of their promise and probable value. Their chief merits lie in the fact that they are immediately realized, they are related to individual effort, and they are practically unlimited in their scope. An interesting illustration of the effects of introducing such plans is reported by Mr. Schwab of the Bethlehem Steel Company.[4]

I happened to be walking through one of our plants not long ago and stopped to talk to one of the men who has been working for us for a long time. He shovels ore. "How much do you get a week?" I asked him. He told me. "You ought to be making more than that," I said. "We ought to pay you a certain amount extra after you have shoveled a stated amount each day."

"There would be no use in doing that," he answered, "because I work as hard as I can, and no matter how hard I work I can't shovel more than a ton of ore in a

[1] LANGSMER, A., Incentives, A Survey of Practices, *Factory Management and Maintenance*, 80: 527–528, 551, 1930.

[2] JUCIUS, M. J., Use of Wage Incentives in Industry, with Particular Reference to the Chicago Area, *Journal of Business of University of Chicago*, 5: 76–85, 1932.

[3] See *ibid.*, Table III, p. 82. *The National Industrial Conference Board* (*N.I.C.B.*) *Reports* are taken from two surveys: the (*a*) groups from *Report* 217, Financial Incentives, 1935; the (*b*) group from *Report* 221, What Employers Are Doing for Employees, 1936.

[4] See WOOLF, S. G., Schwab Tells What Makes Men Work, *The New York Times*, May 10, 1931, Sec. 5, p. 3.

day." However, I made arrangements that that chap should be paid more if he shoveled more. A few weeks later I happened to run into him again. He looked abashed and embarrassed. "What's the matter, Flynn?" I asked. He stammered and halted in his words for a few seconds and then explained, "I'll tell you, Mr. Schwab. The last time I saw you I told you I couldn't shovel more than a ton of ore a day. I thought I was telling you the truth at the time. But since you have made that new arrangement I am handling four tons a day, and it does not seem so hard work as the one ton I did formerly. Each time a shovelful shoots through the air, I say to myself, 'There goes some more money for Flynn.'"

The effects of the introduction of such plans are immediate; whether or not they help toward realization of the ultimate objectives of such plans is not so certain. Their weaknesses are due to the variations both in business cycles and in standard time and production rates set by efficiency engineers. They are a constant source of jealousies; they tend to destroy what semblance of team spirit and cooperative attitude existed in the organization; and they are particularly discouraging to the below-average worker who never seems able to reach the standard quota. Their shortcomings are typical of all financial incentive systems and in their case are accentuated because of their being limited to immediate effects.

Profit-sharing Plans.—From 1794, when the first plan was introduced by one industry in the United States, until the present time, profit-sharing plans have been experimented with by American industrialists.[1] The banner year of their history was 1936, when, owing to federal legislation, profits were distributed in a wholesale manner to both stockholders and employees. The frequency with which they are practiced is indicated in the results from a recent survey made by the N.I.C.B.[2] A survey of 161 companies which had experience with a profit-sharing plan showed that, in 1937, 50 of these plans were still active, 15 were inactive, and 96 had been discontinued. A similar report of 412 industries in Great Britain and Ireland for 1936[3] showed that less than 2 per cent of the workers in industry were participating in profit-sharing plans, and that the average amount distributed to these was $56.50.

The existing plans have been divided into three groups:[4]

1. Those which distribute to employees a share of the net profits. In this plan all employees, with the exception of a few cases in which a definite length of service is specified for eligibility, share in the net profits of the company. The distributions are

[1] See Profit Sharing, *Report* 211 *of the N.I.C.B.*, December, 1934.

[2] Quoted from Profit Sharing, *Studies in Personnel Policy*, No. 2, The Conference Board, New York, 1937.

[3] Quoted in *The Management Review*, 27: 27, 1938.

[4] See Profit Sharing, *Studies in Personnel Policy*, No. 2, The Conference Board, New York, 1937.

usually made on the basis of employee earnings, employee savings, or employee base rate. The amount of net profits distributed varies between 10 and 33⅓ per cent of the earnings. In occasional cases the percentage of distribution increases as earnings increase; for example, in one company the profits were distributed monthly on the following basis: if the earnings were between $6,000 and $8,000, 3 per cent was distributed; if they reached $10,000, 5 per cent was distributed; and the percentage was gradually increased to as high as 35 per cent when the earnings reached $85,000. Profits are payable at different times in different concerns; the most common practice is to make annual payments, but there are many cases where semiannual and monthly payments are made. Usually, payments are in cash, but occasionally the profits are put into a retirement allowance fund or into a combination savings and pension plan.

2. Those which distribute a share of the profits after making the deductions that are necessary for meeting dividend requirements. The length of required service in order that an employee shall be eligible to share in the profits ranges from 3 months to 2 years, and the amount to be distributed is quite often divided into classes before being apportioned to the workers in each class, on the basis of their rate of pay. The percentage distributed is usually larger than that given by companies with no dividend demands, the range being from 25 to 100 per cent; for example, one company, after deducting from the profits for stock dividends and taxes, divided 60 per cent of the balance among its employees in three ways. Twenty per cent was paid in cash to all below the executive group, another 20 per cent was credited to the same group to purchase the company stock, and another 20 per cent was distributed among the executives.

3. Those in which the amount distributed to employees is dependent upon the amount distributed to stockholders. In this form the most common custom is to pay each employee the same percentage of his annual earnings that is earned by the common stock or paid to the common stockholders.

Various other forms of profit-sharing plans have appeared from time to time, some of them being of very short duration and others being still in existence. The reason for their adoption have varied. At times they owe their existence to the beneficence of a paternalistic executive; at other times they are distributed because of a low wage that has made excessive profits possible. Sometimes they take the form of a sop to agitated workers; and at other times they are distributed to a small group in order that payment of taxes may be escaped. Their value depends upon the extent to which the purpose for which they were introduced is realized. True, there are times when there is no objective in view—a kind heart does not look for rewards; but these cases are generally lim ted to small companies with fairly stable groups of employees. Usually there is some reason for the distribution and some hoped-for benefit that its use will produce.

The extent to which these hopes are realized is indicated in the joint picture presented by two surveys. Table 65 includes two types of report: the A column lists the reasons, as they are given by varying percentages of 65 companies, for introducing the plan and the benefits which they hoped to get from its use; the B column lists the actual benefits which varying percentages of 46 companies derived from the

plan after it had been in operation for some time. The two surveys are from reports of the N.I.C.B.[1]

TABLE 65.—PURPOSE OF AND BENEFITS FROM PROFIT-SHARING PLANS

Purpose or benefit	A group		B group	
	Number	Per cent	Number	Per cent
Belief in principles involved	26	40		
Increased efficiency	19	29.2	9	20.0
Improve morale	14	21.5	20	43.7
Create greater interest in the company	12	18.5	6	13.0
Reduce labor turnover	9	13.8	10	21.7
Adjust compensation	7	10.8	2	4.3
Promote employee thrift	6	9.2	3	6.5
As a result of strike	2	3.1		
Uncertain of benefits			11	23.9

Statements from some of the companies in which the plan has been judged a success are as follows: "The best efficiency and finest cooperation from our employees we have ever enjoyed," "One of the best means of creating friendship with the employees that we have found," "It has proved successful with us over many years' trial. It has keyed up the organization, kept everyone on his toes, has provided the incentive for extra effort, and has been the means toward stimulating and maintaining high standards of quality and the elimination of undue waste."

These optimistic reports, however, are not unanimous. Against profit sharing as a valuable incentive tool there are many objections. Among them the more important are

1. The plan does not act as a spur to increased individual effort. This is particularly true of large organizations in which, as Dubreuil says,[2] "the actual profits of a company will not vary directly with the efforts of any one or two people or groups of people." As a general rule, the larger the number of people who participate in a profit, the smaller is the opportunity for any one person to exercise any appreciable influence on the total profits. Employees are quick to realize that fact and adjust their temporarily increased pace to the customary standard. The Postal Telegraph Company[3] early became aware of this weakness and attempted to overcome it in the following manner. All employees were

[1] See Profit Sharing, *Studies in Personnel Policy*, No. 2, Tables 4 and 5, pp. 12 and 13, The Conference Board, New York, 1937.

[2] DUBREUIL, H., Incentives and Personal Enterprise, *The Human Factor*, 6: 130, 1932.

[3] CHINLUND, E. F., Incentive Plans of Postal Telegraph, *Personnel*, 8: 61–63, 1931.

divided into groups small enough so that their performance might be measured with a fair degree of accuracy, and they received a share of the profits which was closely related to the degree of efficiency with which each did the assigned task; for example, the office force was divided into small groups of similar workers, and a standard was set for each group. The level reached above the set standard determined the percentage of distribution of the revenue. When the revenue exceeded a set standard, a graduated percentage was distributed to the employees in varying ratios which were determined by the excess-of-standard office efficiency.

In spite of these attempts to overcome this fundamental weakness, the effectiveness of the tool in increasing individual efforts and keeping them at a constantly high level has not been noteworthy. This may be due in part to the fact that there are so many other factors which are not under the control of the individual that a "what's-the-use?" attitude quickly develops. Changes in business conditions, prices of raw material —which always seem to increase production costs—new tariff regulations, and the many other factors that affect the commodity market are all out of the control of any one employee, and they are potent forces in conditioning the state of the ledger.

2. A percentage profit is difficult to estimate, and still more difficult for the average employee to understand. To explain to the average eighth-grade graduate the importance of contingent funds, reserve funds, depreciation, expansion funds, and the many others in which parts of the profits must be placed if stability is to be maintained, and then to justify a distribution of "only 10 per cent" of the profits, is a task that will tax the ingenuity of any accountant. It is questionable whether or not the dissemination of such information is of any value. For those who can see the company's problems from the management's standpoint, the disclosure of such information has been a cause of increased efforts and renewed sacrifices, but for the large percentage of employees who regard themselves as temporary workers, and who lack the one element that they prefer above all others—security, or tenure of office the problems of the company are of importance only to the extent that they affect the particular worker. Information of any kind is most appreciated when it is asked for; why create the situation which inevitably leads to endless discussion and confusion?

3. A general distribution of profits has all the earmarks of a Christmas bonus—an indiscriminate gift to all, regardless of any of the factors which make a distinction between good workers and average workers who are on the same pay level. The constant plodder receives no more encouragement than does the chronic slacker. All are treated alike, individual effort and ability get no special recognition, and the result is a reduction of the efforts of all to the irreducible minimum.

4. It is of necessity a "long-distance" incentive, and depends for its effectiveness upon the promise and likelihood of returns which may or may not be realized. One executive who has had considerable experience with different types of profit-sharing plans says, "The average worker cannot take a long view and regard the success of the business as a whole as essential to his personal welfare." This is particularly true in large organizations where an individual plodder seems to be constantly discovering people on the pay roll "who don't seem to have anything to do," but formulate policies and make speeches. The necessary planning for the future and the outlay for expansion purposes are temporarily expensive to the employee who sees his profits "eaten up" in such ventures. It is doubtful whether any person who does not regard his position secure and himself a member of the organization should be asked to participate in a scheme the scope of which is beyond the bounds of his interests.

5. Profit sharing tends to accentuate the swing of the employee's income, and to shift emphasis from steady wages to the regularity of the supplementary income. Base wages tend to advance less rapidly, and in times of recession the profit disappears. Meanwhile, the worker has come to expect a continuance of the supplement and has adjusted his expenses accordingly. The enthusiasm which greets the first few dividend distributions is replaced after a surprisingly short time by a fear that the earnings of a particular month should fall below normal. If they should fall, and if the dividend should decrease or vanish, confidence in the efficiency and sincerity of management would dwindle to the vanishing point. Even if a regularity of supplement payment is maintained, the most common effect is the induction of a static state in which the profit is regarded as a normal payment. The experience of one company typifies a fairly general condition. "For a considerable time it seemed to have a very definite incentive value, but as time went on and the semiannual distribution of the employees' dividend averaged somewhere near a uniform amount, it seemed to be more and more taken for granted and therefore less and less of an incentive."

6. Some indication of the weaknesses of profit-sharing plans can be gained from the reports of companies that have discontinued using them. In a survey made in 1937 by the N.I.C.B.,[1] 96 of the 161 companies that had installed profit-sharing plans had discontinued using them. The reasons for their discontinuance are listed in the table on page 259.

Of these factors responsible for the canceling of the plans, the most important, with the exception of the "no-profits" cause, was the workers' lack of interest in or opposition to the plan. This was due primarily

[1] See Profit Sharing, *Studies in Personnel Policy*, No. 2, pp. 14–15, The Conference Board, New York, 1937.

TABLE 66.—REASONS WHY 96 COMPANIES DROPPED PROFIT-SHARING PLANS

Reasons given	Companies represented	
	Number	Per cent
1. Unfavorable reaction of employees:		
a. Employee dissatisfaction or indifference	19	19.8
b. Employees preferred entire amount in pay envelope	8	8.3
c. Union agitation	4	4.2
2. Company dissatisfaction:		
a. Generally unsatisfactory	6	6.2
b. Replaced by other forms of compensation	5	5.2
3. Other causes:		
a. No profits	21	21.9
b. Change of management, merger, or out of business	14	14.6
c. Government interference	8	8.3
4. No explanation	11	11.5

to their inability to understand the principles involved and the possible relation between individual efforts and increased profits. Of approximately equal importance was the length of the interval between the announcement of the plan and the payment of the reward. The vice-president of one of the companies reported, "The vast majority of our employees showed a keen interest in the plan two or three weeks prior to its distribution, but unfortunately one week after that time they seemed to forget all about it. In short, the system was not productive of developing a keen interest in the work."

It is interesting to compare the reasons offered by these companies with those offered for the discontinuance of profit-sharing plans in Great Britain. The Ministry of Labour included in its annual report for 1936 an account of 532 plans that had been in operation at the beginning of the year, 330 of which had been discontinued, and classified the reasons that had been advanced for their being dropped. The table on page 260 gives that report.[1]

Again the interesting fact stands out that employee apathy, dissatisfaction, or direct opposition was responsible for the greatest number of failures, with the exception of the "no-profits" cause. A plan that results in dissatisfaction among the people whom it is supposed to benefit must have something inherently wrong in its structure. Successful incentive plans cost something to all participants; it is true in the world

[1] See Profit Sharing and Co-partnership, *The Ministry of Labour Gazette*, August, 1937, p. 294.

TABLE 67.—REASONS FOR DROPPING 330 PROFIT-SHARING PLANS IN GREAT BRITAIN

Reasons	Companies	
	Number	Per cent
1. Apathy of employees or dissatisfaction of employers with results	87	22
2. Dissatisfaction of employees	16	4.1
3. Substitution of increased wages, shorter hours, or other benefits	43	10.9
4. Business conditions, diminishing profits, losses	104	26.3
5. Changes in management	52	13.2
6. Company gone out of business	49	12.4
7. Other causes, reasons not given	44	11.3

of business, as it is in all other relationships, that the activities which man appreciates most are those which cost him the most, if not in cash, certainly in time, thought, and effort. No plan can be successful which is passed out as a gift; any operating plan must first consider employee preferences, and second be just to all participants.

7. Supporting the other objections to profit plans is the attitude of labor unions. A report[1] of the N.I.C.B. states, "labor unions, while endorsing the principle that a larger share of manufacturing income should go to labor, insist that the additional amount should be paid in fixed regular wages not subject to fluctuations that are characteristic of profits."

The value of profit sharing in an organization can best be summed up in the concluding words of a report of the N.I.C.B, published in 1934:[2]

> Profit sharing as a reward for effort can thus be said to be successful when the employees covered by the plan are limited to executives and department heads, or, in other words, to those who understand its possibilities and are in a position to contribute actively to the profit of the enterprise. It is not so successful when this limitation does not exist.

MINOR FINANCIAL INCENTIVES

Supplementing and sometimes replacing either the wage-incentive or the profit-sharing plans are others which are usually less expensive to operate and less comprehensive in their scope. Four of these merit consideration.

Group Incentive Plans.—In these plans a standard is usually set for a department or a section, and wages are prorated among the members on

[1] See Profit Sharing, *Studies on Personnel Policy*, No. 2, p. 17, The Conference Board, New York, 1937.

[2] See Profit Sharing, *Report* 211 *of the N.I.C.B.*, December, 1934, p. 19.

the basis of a guaranteed hourly rate and a supplementary bonus for increased production beyond the standard. The infrequency of the use of these plans is due to employees' mistrust of time-and-motion-study men, and to their fear that the wage level will be lowered if production continually exceeds standard. Supporting these reasons also is the attitude of disapproval taken toward those who constantly exceed the standard. The result is that the better workers in the group slow down their pace to the level of the average, or quit.

A. W. Kornhauser gives an interesting illustration of this.[1] The daily records of women sewing-machine operators who were engaged in making simple belts ranged from 13 dozen to 24 dozen per day, with the majority of the operators completing 23 dozen daily, a very few completing 24 dozen, but not one going above 24. In any group of operators there will be a normal distribution of ability, with the majority working at average pace, in this case 23 dozen daily, and an equal number above and below that. The interesting phenomenon here is that the better workers had all become average and had pulled down their level to that of the mediocre workers. Interviews with the workers showed that to be the case. The group had set a limit beyond which it was not sportsmanlike to go. Informally, but quite rigidly, the group enforced that standard. Anyone who refused to limit their output became an outcast, an enemy of the rest; too much production may cost all or some of them their jobs.

This is the factor that is primarily responsible for the failure of group incentives, if they are the only motivating force. Unless they are accompanied by guaranteed security, the group incentives become a form of group limitation.

Savings Plans.—In these plans the most common custom is for a weekly or monthly deposit of a small percentage of the employee's wages to be put in trust at a guaranteed rate of interest, under the supervision or advice of either a committee selected by employees and management or a trusted member of the executive force. The extent to which these plans are used is indicated in a survey made by the N.I.C.B. in 1936.[2] Of 375 corporations employing 1,528,770 workers, 182—or 50 per cent—were operating a savings and loans plan. Of that number, 140 were operating a bank savings plan, 19 a company savings plan, and eleven a pooled savings and investment plan. The implication of savings plans is that the employee has not enough foresight and financial wisdom to care for his future, and the company, therefore, acts as a guardian for his future interests. The extent to which this is justified is uncertain. In

[1] KORNHAUSER, A. W., Workers' Motivation and Production, *Personnel Service Bulletin*, vol. 9, No. 2, 1933.

[2] Savings Plans and Credit Unions in Industry, *Report* 225 *of the N.I.C.B.*, 1936.

two different organizations, the report has been given that approximately 20 per cent of those who were averaging over $100 per week for more than a year, and had been released, were on relief within 2 months after they left the factory. The resentment of the average worker against any form of paternalism makes the introduction of the plan a task that requires the best tact and ingenuity that the well-wishers of any organization have.

Stock-purchase Plans.—Instituted as a means of creating more interest in and loyalty to the organization on the part of selected and more responsible employees, stock-purchase plans between 1915 and 1925 were extended to the rank and file of employees, and were adopted by a large number of companies. Estimates of the number still using them, or having used them, vary. The rapid rise in their adoption is shown in a study made by the N.I.C.B. in 1928.[1] The number of new adoptions in six successive 5-year periods was as follows: before 1900, 3; 1900–1905, 14; 1906–1910, 13; 1911–1915, 30; 1916–1920, 111; 1921–1925, 162. In 1931 G. A. Bowers estimated that[2] there were at least 400 companies in the United States which had employee stock-purchase plans. A study made in 1936 by the N.I.C.B.[3] of 2,452 companies showed that 166 of the 375 companies that had stock-purchase plans were still continuing them, but "many of the companies are no longer offering stock for sale to employees . . . employees are still making payments on earlier offerings." A similar study of 50 stock-purchase plans, which had been in existence before the depression, was made by the Industrial Relations Section, Princeton University, in 1932[4] and showed that only 16 of them were still in effect; some of these were kept open because employees were still paying for earlier offerings.

The objectives in offering stock to employees, usually at considerably below the market price and on easy payment plans, have been those that are customary when any incentive plan is introduced: an inducement to be more careful over company property, to eliminate waste, to reduce labor turnover, and to take a more active interest in the welfare of the organization. Supplementing these is the feeling of pride which it is hoped will be induced by part ownership in the business—the enhanced feeling of importance because of having a direct voice in the determination of company policy, and the provision of security upon retirement.

[1] Employee Stock-purchasing Plans, a summary of a survey made by the N.I.C.B., *Manufacturing Industries*, October, 1928, p. 462.

[2] Bowers, G. A., Employee Investigation in Company Securities, *Handbook of Business Administration*, ed. by W. J. Donald, pp. 1385–1399, McGraw-Hill Book Company, Inc., New York, 1931.

[3] What Employers Are Doing for Employees, *Report* 221 *of the N.I.C.B.*, 1936.

[4] *Employee Stock Ownership and the Depression*, Industrial Relations Section, Princeton University, 1932.

The extent to which these objectives have not been realized is indicated in the reasons that have been offered for discontinuing the plan. The more important of these reasons are the following:

1. Employers have not succeeded in inducing employees to regard themselves as part owners of the business. Instead of that effect, the most common result has been a criticism of management because its stock moves less rapidly than others, slumps below the purchase price, or is sold by them at a lower price than is available at a later date. The average worker rarely has sufficient information about the causes of market fluctuations to attribute adequate causes to stock market dips. If anyone has, or thinks he has, such information, he hesitates to give it, unless he is a professional financial counselor. These factors have convinced management that stock ownership is not a suitable form of investment for the rank and file of workers. "If we ever do adopt another such plan," says an executive of a large concern, "it will be much more limited as to the employees to be included thereunder. My own personal recommendation is against a company stock-purchase plan for rank and file employees, as we now understand it."[1]

2. Employees have discovered that the savings necessary to meet the purchase demands necessitate their pooling all their eggs in one basket. If the company for which they work meets financial adversity, they lose not only their source of current income but their past savings. In that respect the employee is acting contrary to the advice of all impartial financial counselors, *viz.*, distribute your investments.

3. The plans failed to realize the object for which they were instituted. They did not provide a stable source of income; they did not guarantee a retirement fund; they did not induce a greater degree of cooperation or give any marked evidence of building up company morale; and they committed large numbers of people to long periods of time payments for stock that at times is practically worthless.

4. Other factors responsible for the disappearance of such plans are primarily due to an extended depression: reduced employee earnings, low security prices, wide market fluctuations, financial difficulties of companies, mergers with other companies, employee cancellations of, and general lack of confidence in the merits of, common stock.

Pension Plans.—Of these there are four types, some of which have been in industry since 1874:

a. Noncontributory, in which the total cost is borne by the company.

b. Contributory, in which a fixed percentage of the wage is contributed by the employee and an equal or greater amount by the employer.

c. Funded, in which a certain amount is set up annually as a reserve against a pension liability, similar to that set up for depreciation of equipment.

[1] *Ibid.*, p. 27.

d. Unfunded, in which the amount annually paid to annuitants is charged up as pay-roll expense.

In the early days of pension plans the majority were of the noncontributory type. These were discontinued in the second and third decade of this century, and replaced by the contributory type of plan; and the responsibility of administering the plan has changed from management by individual companies to management by well-established insurance companies.

The amount paid by employer and employee varies, not only from company to company, but for different classes of workers in the same company. The variations in the contributions by different employees of the City of New York will illustrate the tendency, not only among some city employees, but also among employees in industry.[1] Table 68 gives the percentage paid by the city and by the employee in six different departments.

TABLE 68.—NEW YORK CITY'S PENSION PLAN

Group	Employee's share, per cent	City's share, per cent
Teachers, members of Board of Education, and city educational employees	45	55
Street-cleaning Department	27	73
Police Department	21	79
Health Department	2	98
Fire Department	0	100
Combined pension fund	36	64

The total fund costs the city approximately $30,000,000 annually. Modified forms of this plan had been adopted by a number of industries even before the enactment of the Social Security Act. One plan which is being sponsored by numerous organizations and is gaining adherents annually[2] is patterned after the teachers' annuity fund that was organized and is sponsored by the Carnegie Foundation. Under that plan the participating colleges contribute 5 per cent of a teacher's salary annually and the interested and eligible teachers contribute another 5 per cent. The total deposits are allowed to accumulate until the teacher reaches his stated retiring age; thereafter, he is paid a monthly income, which is

[1] PARSONS, G. C., Industrial Pension Plans, *The Annalist*, 43: 811, 885, 910, 916–917, 1934.

[2] See DONALD DESPAIN, A Formula for Effective Employee Relations, *Commerce*, September, 1937, pp. 16–23, and M. J. EVANS, A Profit-sharing Retirement Fund Plan That Has Worked Successfully, *The Iron Age*, July, 1937, pp. 28–42.

based on the total deposits and which is guaranteed in advance. A number of organizations have made similar arrangements with insurance companies. The plan suggested by Despain is representative. In that plan each employee contributes from 2½ to 5 per cent of his earnings and the company contributes an amount that varies between one and four times that paid by the employee. The joint contributions accumulate in an inviolate trust, managed by the insurance company or by representatives of employer and employee, and give either a guaranteed retirement allowance or a lump-sum payment in case of death.

Pension funds no longer belong to the realm of incentives. Since the enactment of compulsory legislation, they are among accepted company obligations, and are regarded as necessary expenditure. Since the enactment of the Social Security Act of 1935, both employer and employee are obliged to contribute a definite percentage to a federally operated annuity fund, similar to that which has been in operation in some European countries—particularly France and Great Britain—for some years. The inadequacies of such a fund for meeting the needs of all grades of workers are being met by supplementary contributions made by individual organizations, or by a continuation of a modified form of the pension fund that had already been in existence; for example, Eastman Kodak has adopted a plan for its employees in the United States, similar to that used in the interests of its employees in France, whereby all the employees were guaranteed an annuity of 2 per cent of their salary per month. It is by means of such supplementary schemes that the defects of any general plan, which can never do justice to and include all, can be remedied. Such obvious defects of the security law as its graduated retirement scale and its flat death payment of 3½ per cent of the wages received by the employee from the time he entered the plan until his death, are destined to produce inequalities and injustices the remedies for which can be found only in adjustments by individual concerns with which the particular employees are identified.[1]

Value and Criticism of Financial Incentives

The net result of some of these financial incentives has been a varied increase in production rate, an occasional increase in average earnings, and a frequent decrease in production costs. One study[2] reports an increase in production levels of from 1 to 18 per cent, an increase in earnings of from 1 to 30 per cent, and a decrease in cost of from 1 to 11 per cent. As a tool for the development of increased interests and loyalty,

[1] For a discussion of the defects of the Social Security Act, see M. B. Folsom, Company Annuity Plans and the Federal Old Age Benefit Plans, *Harvard Business Review*, vol. 14, 1936, pp. 414–424.

[2] Incentives for Piece Workers, *Industrial Relations*, 2: 446–447, 1931.

some financial incentive is a necessary part of any well-integrated personnel program and produces desirable effects when the following conditions are met:

a. When the plan is directly related to individual efforts. "The effectiveness of any form of financial incentive depends largely upon the reliability and precision of the measurement of employee skill and effort, and the faithfulness with which these measurements are followed as a basis of payment, promotion, or discharge."[1] Any financial plan that treats all alike and gives no recognition to individual effort and capacity is destined to defeat its own ends. A group or mass appeal has value for immediate action, but for the type of response that industry seeks—permanent, enduring, and maximal—the incentive must be individual.

b. When it is used in conjunction with other types of incentives. If the plan is used alone, it makes an appeal to only one side of an employee's interests—the urge for gain—and tends to develop an individualistic attitude. No incentive plan is adequate that ignores the major fundamental urges—the desire for the respect of others, for self-expression, and for self-realization. The fear of insecurity, of social pressure, of loss of prestige, and of permanent incapacity must be removed if the incentive plan is to be effective in establishing the will to work and a completely cooperative attitude.

c. When it represents an appreciable addition to the standard wage rate, when it is not used as a justification for low piece or day rates, when its bases are determined in advance and the amount that is likely to be received by any employee is subject to easy calculation, and when it is accompanied by a careful selection, training, and promotion program. The individual employee must know the value of his efforts, should not be affected by the carelessness of another employee, and should have well-known promotional possibilities for the additional efforts he displays.

NONFINANCIAL INCENTIVES

The recognition of the fact that financial incentives form only one part of a well-planned motivational program has led to the quest for other tools that may be used to induce employees to treat the company as if its property were theirs, and to give them an opportunity to exert their best efforts and capacities in relation to its demands. To this end, management has repeatedly asked such questions as: What do workers want? What are they interested in? What would they like us to do for them? Workers' wants have been the subject of speculation since industry began. Classifications of such wants have been offered by economists, sociologists, and psychologists. Those offered by economists and sociologists have been based on observations and interpretations; those offered by psychologists have been based on speculations, hypotheses, and analogies to forms of animal behavior. Tables 69 and 70 give representative classifications, the former listing the economists' interpretations, the latter consisting of groups representative of the interpretations offered by psychologists.

[1] SMITH, E. D., Wages as Incentives, *Handbook of Business Administration*, ed. by W. J. Donald, p. 1165, McGraw-Hill Book Company, Inc., New York, 1931.

TABLE 69.—ECONOMISTS' LIST OF WORKERS WANTS[1]
(Arranged in order of frequency of listing)

1. Security
2. Possibility for advancement
3. Recognition
4. Self-respect
5. Opportunity to make a little extra
6. A voice in fixing employment conditions
7. A fair share of the profits
8. Working hours yielding reasonable leisure
9. Prevention of profiteering
10. Elimination of suspicion
11. Confidential relations with superiors
12. Recognition of mutual interests
13. Creation of machinery for facilitating acquaintances
14. Absence of all paternalism
15. The presence of modern production methods
16. A progressive national trade policy
17. No labor restrictions of output
18. No narrow trade demarcations
19. Reasonably good working conditions
20. Rate of pay commensurate with effort, responsibility, and output

[1] The list includes classifications from the following: WILLIAMS, WHITING, What's on the Worker's Mind, *The Human Factor*, 10: 89–98, 1936; CALDER, J., Extract from address on Workers' Wants, quoted in *Personnel*, 1 (No. 11): 3, 1919; WHITEHEAD, H., What Men Want in Their Jobs, *Industry Illustrated*, April, 1937, p. 10.

In Table 70 are given various classifications of the postulated urges, drives, impulses, instincts, and tendencies that act as inner forces compelling men to perform definite types of activity.

Implicit in all these classifications is the assumption that man is a composite of a number of separable tendencies, to each one of which, or to any combination of which, an appeal can be made; the extent to which the appeal satisfies the tendency is indicative of the quality and quantity of the resulting response. To simplify the confusion that results from the multiplicity of drives or urges or motives that different classifications offer, others, particularly those with a pet philosophical system or with psychoanalytic leanings, have reduced all tendencies to one, with as much disagreement concerning the essential nature of that one as there is among the varied classifications of those who offer large groups. To some the one driving force is the lust for power, to others it is a craving for the opposite sex; to some it is a vital principle, a creative urge, an *élan vital*, while to others it is the spiritual principle of existence, a transcendentally apperceived unity, an overindividual mental configuration,or a hedonistic set of values.

For practical purposes these classifications are nothing more than logical abstractions, without any particular significance, without any discoverable structural bases, and without any effect on the individual

TABLE 70.—PSYCHOLOGISTS' LIST OF WORKERS' DRIVING FORCES

Group I (after Murphy)[1]

a. Visceral drives: hunger, thirst, air getting, temperature regulation, sex, etc.
b. Activity drives: exercise, rest, preservation, rhythm, novelty, exploration, etc.
c. Aesthetic drives: color, tone, rhythm, specific qualities of taste, touch, and smell
d. Emotions: fear, rage, disgust, shame, etc.

Group II (after Drever)[2]

a. Appetities
  1. General: seeking pleasure and avoiding pain
  2. Specific: hunger, thirst, sleep, sex, nausea

b. Instincts
  1. General: play, experimentation, imitation, sympathy, suggestibility
  2. Specific: different types of reaction, and all forms of emotion

Group III (after Warren)[3]

a. Nutritive: metabolic expressions, walking, feeding, wandering, avoiding, acquiring, cleanliness
b. Reproductive: mating, maternal, filial
c. Defensive: flight, subjection, kicking, avoiding, modesty, clothing, constructing
d. Aggressive: fighting, resenting, domineering, rivalry
e. Social organization: family, tribe, attitudes of others, sympathy, antipathy, cooperation
f. Instinctive tendencies: imitation, play, curiosity, dextrality, aesthetic expression, communication

Group IV (Instinct lists)

a. Parker's list[4]
  Gregariousness, parentality, curiosity, acquisition, fear, mental activity, housing, migration, hunting, anger, revolt at confinement, revulsion, leadership, subordination, display, sex

b. McDougall's list[5]
  1. Primary: flight, repulsion, curiosity, pugnacity, self-abasement, self-assertion, parentality, sex, food, gregariousness, acquisitiveness, constructiveness
  2. General: suggestion, imitation, play

[1] MURPHY, G., *Experimental Social Psychology*, 2d ed., p. 99, Harper & Brothers, New York, 1937.
[2] DREVER, J., *Instinct in Man*, p. 169, The Macmillan Company, New York, 1917.
[3] WARREN, H. C., *Human Psychology*, p. 106, Houghton Mifflin Company, Boston, 1919.
[4] PARKER, C. H., *The Casual Laborer and Other Essays*, pp. 141-145, Harcourt, Brace and Company, New York, 1920.
[5] McDOUGALL, W., *An Introduction to Social Psychology*, 16th ed., pp. 47–119, John W. Luce & Company, Boston, 1923.

except in the interplay of concrete experiences and definite situations. To the employer the human being is a total entity who acts as a unit and who throws himself as a unit into his work; he may not work to the limit of his ability, but the percentage that does work is a percentage of the whole man—not an isolated active part, with all the other parts neutral. He may be motivated by a set of values, a collection of biological forces, or a number of socially disturbing situations; the interpretation of what drives the individual worker is of very little importance when one is faced with the issue, what specifically does he want and what will enlist his cooperation?

Some indication of the factors that appeal to workers' wants is given in a number of studies that have been made. In 1932 S. N. F. Chant made a survey of the judgments of 250 young men on the factors about their jobs that made the greatest appeal to them. Of these men, 100 were employees in a large department store, and the remaining 150 were employed in a wide variety of occupations. Twelve factors were agreed upon as important, and these were paired, each one with every other, making a list of 66 paired items. The list was given to each person with the instruction: "Underline the one item in each pair that you consider to be the more important to you in your job."[1] In another study, 10 of these factors, selected and paired in the same manner, were given to 325 factory operatives in England.[2] All the operatives were female, and they were selected from different types of factories in different parts of the country. The results from the two studies are given in Table 71, Chant's results appearing in the first two columns and Wyatt's in the third.

TABLE 71 —RANK POSITIONS OF FACTORS THAT APPEAL TO WORKERS

Factors of interest	100 department-store workers		150 miscellaneous workers		325 factory workers
	Rank	Scale	Rank	Scale	
Opportunity for advancement	1	5 0	1	5 0	5
Steady work	2	4 0	2	4 15	1
Opportunity to use your ideas	3	3 75	3	3 75	7
Opportunity to learn a job	4	3 40	3	3 75	8
Good boss	5	3 25	5	3 0	4
High pay	6	2 6	7	2 6	6
Opportunity to be of public service	7	2 5	5	3 1	
Good working companions	8	2 25	8	2 4	3
Comfortable working conditions	9	2 15	9	2 2	2
Good hours	10	2 0	11	1 95	9
Clean work	11	1 75	10	2 1	
Easy work .	12	75	12	1 0	10

The interesting fact deduced from Chant's study is that the factors on which unions place major emphasis were given subordinate positions in comparison with other factors that were consistently of more importance to the workers. The consistent demands from every group are that

[1] CHANT, S. N F , Measuring the Factors That Make a Job Interesting, *Personnel Jour* , 11: 1–4, 1932.

[2] WYATT, S , and J N LANGDON, Fatigue and Boredom in Repetitive Work, *Industrial Health Research Board Report* 77, pp. 43–46, 1937.

they be given opportunity for advancement and steady work; the tendency is for the younger workers to be more interested in the former and the older groups to be more interested in the latter. The position given to "comfortable working conditions" is a little surprising in view of the agitation in its interest and the amount of emphasis laid upon it by different industrial relations departments. "Easy work" and "clean work" come at the bottom of the list—a fact that runs counter to the oft-repeated cry that workers are lazy and are looking for snap jobs.

The variations in the importance of any one factor to the different workers is shown in the position given to one item—opportunity for advancement—by the subjects in Wyatt's study. In Table 72 are reported the positions given to that factor by the various workers.

TABLE 72.—INTEREST IN "OPPORTUNITY FOR PROMOTION" AMONG 325 WORKERS

Position	Top 10th	9th	8th	7th	6th	5th	4th	3d	2d	1st
Number of workers	7	18	37	42	40	45	53	31	28	22
Per cent	2.2	5.6	11.5	13.0	12.4	13.9	16.4	9.6	8.7	6.8

The differences in the two studies are due to a number of factors. The fact that women workers were contrasted with men workers accounts for some of these differences; variation in factory conditions, for others; and the lack of interest in specific types of factors, for still others. "Good working companions" and "comfortable working conditions" mean more to the women than to the men, while to the former "opportunity to use your own ideas and to learn a job" means less. "Opportunity for advancement" is of much less importance to the women workers than is steady work or comfortable working conditions.

The interesting result gleaned from Wyatt's study was the fact that almost every one of the 10 factors was given first place by some workers. It lends proof to a fact that is often ignored, *viz.*, that there is no one type of incentive that will appeal to all workers; incentive programs call for as much variety as there is among the workers of the group. Workers' interests vary, not only from man to man, but within the same person from time to time; what is uppermost at one time, especially if it is lacking in one organization and present in an adjoining one, will seem of minor significance at a later time. Any program, to be effective, must take cognizance of these variations and provide an opportunity for the release of human energies in a number of forms. Some of the more important and insistent normal desires and the recognition of them in incentive programs are discussed here.

UNORGANIZED NONFINANCIAL INCENTIVES

A Desire for Commendation.—Mr Schwab of the Bethlehem Steel Company is quoted as saying:[1]

There is nothing that so kills the ambition of a man as criticism from his superiors. . . . I am lavish in my praise but sparing in my criticism. If a man does a good job, I do not hesitate to tell him; if he does a poor one, I prefer to remain silent . . . when I see good in other people's work, I do not hesitate to mention it. A little bit of praise affects the sweating puddler as it does the President of the United States. All this talk of not meaning anything is just bluff.

The reflections of Mr. Schwab are supported by experimental evidence. Repeated proof that the effects of praise are better than those resulting from blame has been given in a number of academic studies. The results of a number of them are reported Table 73.[2]

The implications from these studies are obvious. In order of average value, the most effective tools for getting improvement in results are public commendation, with an average improvement of 88 per cent; private reprimand, with an average of 66 per cent; private ridicule, with a 33 per cent average; private sarcasm, with a 28 per cent average; and public ridicule and public sarcasm, with 17 per cent and 12 per cent, respectively. An interesting circumstance consistently revealed in these studies is the manner in which the low-grade students respond to praise and the high-grade students to private reproof; without exception, the most effective tool for the former was public praise and for the latter, private reproof.

Statistical data on the same factors for business and industry are not available, but the following inferences are supported by many observations and conferences:

a. Criticisms and reprimands should be based on facts, and should involve personalities as little as possible. Public criticisms are rarely justified, and usually result in the development of an antagonistic attitude. It is very unusual for public criticism of one of the opposite sex to produce the desired results.

b. Reprimands in private should be prefaced with a catalogue of some of the more desirable qualities and production records. Mistakes are more easily corrected when contrasted with desirable types of work performed by the person who is being repri-

[1] WOOLF, S. G., Schwab Tells What Makes Men Work, *The New York Times*, May 10, 1931, Sec. 5, p. 3.

[2] The data in this table are taken from the following studies: BRIGGS, T. H., Praise and Censure as Incentives, *School and Society*, 26: 596–598, 1925, and Sarcasm, *School Review*, 36: 685–695, 1928; and LAIRD, D. A., How the High School and College Students Respond to Different Incentives to Work, *The Pedagogical Seminar*, 30: 358–371, 1923.

manded. Pointed questions and problem situations usually are effective in bringing to light employee weaknesses.

c. Commendations should be based on actual performances that give evidence of superior ability, or on performances that are above the average for the employee in question.

TABLE 73.—EFFECTS OF DIFFERENT TYPES OF INCENTIVE ON WORK

Incentive used		Per cent of students showing		
		Improvement	Same condition	Worse results
Public reprimand	(*a*)	40	14	46
	(*b*)	26	34	40
	(*c*)	38	32	30
Private reprimand	(*a*)	83	10	7
	(*b*)	49	39	12
	(*c*)	67	20	13
Public sarcasm	(*a*)	10	13	77
	(*b*)	6.5	29	64.5
	(*c*)	10	22	68
	(*d*)	21	28	51
Private sarcasm	(*a*)	18	17	65
	(*b*)	44.5	14.8	40.7
	(*c*)	21	49	30
	(*d*)	28	29	43
Public ridicule	(*a*)	7	24	69
	(*b*)	15	49	36
	(*c*)	29	34	37
Private ridicule	(*a*)	21	15	64
	(*b*)	44	51	5
Public commendation	(*a*)	91	8	1
	(*b*)	84	16	0

Knowledge of Progress.—The "beat-your-own-record" maxim has been widely used as a tool in education ever since formal education began. Repeated experiments have proved its value as an incentive; among them, the oft-quoted experiment by Book and Norvelle[1] gives most striking proof of its significance. They divided 124 students at Indiana University into two groups, each of which worked for 120 periods of from 30 seconds to 1½ minutes each, on such problems as cancellation tests, digit-letter substitutions, and mental multiplication. One group, *B*, was told its results at the end of every practice period, and was urged to improve its score and to be on the *qui vive* for short cuts and other methods of speeding up. The other group, *A*, was urged to do its best, but was

[1] BOOK, W. F., and L. NORVELLE, An Experimental Study of Learning Incentives, *The Pedagogical Seminar*, 29 (No. 4): 305–362, 1922.

not given its previous records. The results from the two groups are shown in Fig. 12; the 10 sets of results are the averages of 12 periods each. It will be seen that the *B* group finished the experiment with a 16.5 per cent advantage over the *A* group.

Similar results were gained by Arps[1] in an experiment that he conducted with three adults as subjects. Each subject was given three groups of ergographic tasks, each one of which was divided into four series. In half of the series the results were known to the subject, and in the other half the results were unknown. Each series consisted of 11 work periods separated from one another by intervals of 48 hours. In each period the work was carried to the exhaustion point, *i.e.*,

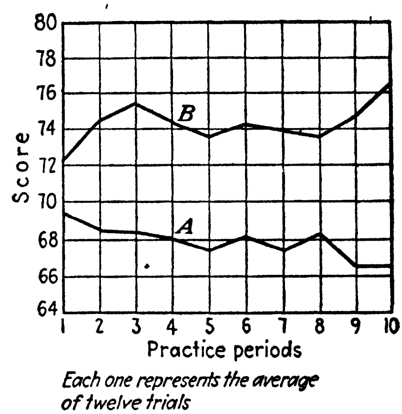


FIG. 12.—Working (*A*) without and (*B*) with knowledge of results. (*After Book and Norvelle.*)

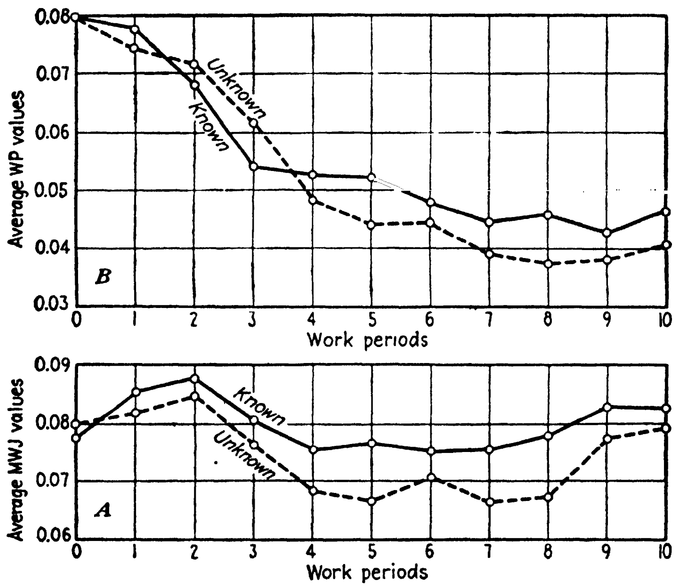


FIG. 13.—Work curves of one person, contrasting achievements when previous records were known and unknown. (*After Arps.*)

to the time when the subject could no longer lift the ergographic load. Figure 13 gives the results from one subject. The graphs are typical

[1] ARPS, G. F., Work with Knowledge of Results versus Work without Knowledge of Results, *Psychological Monographs* 28, 41 pp., 1920.

of the work curves of all three subjects and indicate the basis on which Arps draws the conclusion that "the amount of work and the rate of work done under conditions of knowledge of results exceed those done under conditions of ignorance of results."[1]

The same principle was used by Gilbreth to stimulate each bricklayer to do his best. He devised a method for recording the number of bricks laid by each man, and at frequent intervals he told each worker how many bricks he had succeeded in laying in a set period of time.

Interesting confirmation of the value of knowledge of results in industry is given in the work of Robert B. Wolff.[2] In a paper manufacturing plant complaints were constantly being received from the customers, particularly publishers, that some of the reams of paper did not weigh exactly 32 pounds each. The cause lay in the lack of proper care of the machines by the machine tenders. Frequent correction did not improve conditions. Wolff gave one of the tenders the responsibility of taking samples every time a reel was changed, weighing them, and recording the results on a "reel record." These records were kept attached to the paper machines in the machine room. The effect that the records had upon the machine tenders is shown in the case of one tender, Waite, whose records for three different periods—Oct. 15, 1917, Nov. 26, 1917, and May 9, 1918—are reproduced in Fig. 14, page 275.

The results "indicate clearly the increasing interest in the work and how completely the man became master of the machine." They are typical of the results achieved when a record is kept of past performance and the operative is constantly challenged to "beat his past" record. It is true that this incentive, just like any other, can be overworked and thus made to defeat its own ends. In many cases an intermittent and judiciously selected use of any incentive produces better results than does uninterrupted use of it.

Of equal importance with knowing one's own results is knowledge about the total product in which the individual employee has a share. "The worker would not mind so much being a mere link in a chain if he were permitted to see the rest of the chain."

Competition with Others.—The Jesuits are responsible for the classroom practice of dividing each class into two groups and pitting one against the other. Each individual had for his particular rival another of about equal ability and industry, and was constantly challenged to beat his opponent's record. The practice has received repeated confirmation in education and industry. An interesting academic experi-

[1] *Ibid.*, p. 40.

[2] Wolff, R. B., Nonfinancial Incentives, *Handbook of Business Administration*, ed. by W. J. Donald, pp. 1161–1181, McGraw-Hill Book Company, Inc., New York, 1931.

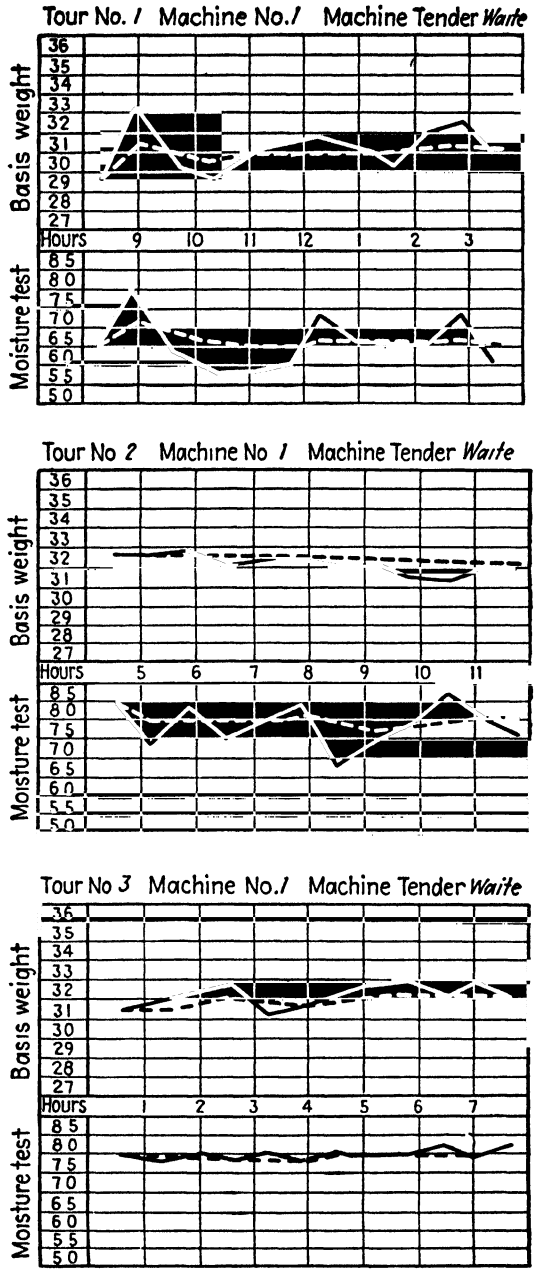


FIG. 14.—Work record of one person, showing improvement resulting from knowledge of daily record. (*After Wolff.*)

ment that gave notable results was conducted by V. M. Sims.[1] Forty-five college students were given Form 2 of the Monroe Standardized Silent Reading Test, and were then divided into three identical groups: (*A*) a control group; (*B*) an informed group, divided into sections, which were pitted against each other; (*C*) an individually competing group, in which each person was encouraged to beat the record of any other in his group. Each group worked for 12 three-minute periods, reading three different types of material, at the end of which time, they were all given Form 3 of the Monroe Test. The *A* group showed an average of 8.7 per cent improvement; the *B* group, 14.5 per cent; and the *C* group, 34.7 per cent.

Another experiment by I. C. Whittemore[2] gave results that proved the value of competition as a means of increasing the quantity of the results. Twelve college students were divided into three groups and worked together for one hour twice a week, printing material with rubber stamps. The results were compared both individually and by groups, and were as follows: (1) The average percentile gain of the competing groups over the noncompeting groups was 26; (2) the subjects least capable in speed profit most from competition; (3) all subjects do poorer work when competing than when not competing. The consistency of this result is remarkable; most experiments show an improvement in quantity but a lowering of quality under competitive conditions.

The value of competition in the world of business and industry is most clearly shown among salesmen. G. W. Lee gives an interesting illustration of its effects.[3] Each of his salesmen was selling from 8 to 10 protectographs weekly, and he felt that the average could be increased by 50 per cent. Selecting one week as experimental, he himself went into the field, after not having sold any for 15 years, and he challenged any salesman to beat his week's record. During the week he sold 22 protectographs, and this achievement of his was equaled by a poor-record salesman. A standing offer of $100 was then given to anyone who could beat that record. By the end of 6 months, one salesman had a week's record of 27, another of 29, and another of 31. Competition as a motivating force works most effectively when used intermittently and when operated in true Jesuit fashion by pitting equals against equals.

Being Given Recognition.—Whiting Williams regards this as the most important constituent of what to him is the mainspring of human activity

[1] SIMS, V. M., The Relative Influence of the Two Types of Motivation on Improvement, *Jour. Educ. Psychol.*, 19: 480–484, 1928.

[2] WHITTEMORE, I. C., Influence of Competition on Performance: An Experimental Study, *Jour. of Abn. Soc. Psychol.*, 19: 236–253, 1924.

[3] LEE, G. W., Our Weekly Sales Record Was Broken *Four* Times in 1928, *Printers' Ink*, 145: 25–28, 1928.

—the wish for worth. "Say, Sarge, for heaven's sake, read out my name for a letter tomorrow. I'll know there ain't none, but, gee, I can't stand it to be the only guy that's never mentioned"—this appeal of the lonely doughboy is one that those who are constantly ignored can easily appreciate. On the other hand, being noticed by someone higher up acts as a ready incentive to cooperative endeavor. Frank Disston reports visiting a factory[1] in which there seemed to be unusual interest in the firm on the part of every worker. He ascribed the cause to one factor of which the following is an illustration. When the general manager was conducting him through the plant, they went up in one of the elevators. As soon as they stepped into the elevator, the manager introduced him to the elevator boy, adding, "John runs the elevator; I run the plant—that's how we work together."

In reply to the question, "Do you make it a point to have a word to say to the man promoted, and do you agree that there is value in a sincere word of this sort?" 63 factory managers gave affirmative replies, of which the following are typical. "I certainly do. This method serves to keep you in close touch with your organization and is an important part of the system." "A proper talk to a man at the time he is promoted by the executive head of the business is of the greatest importance." "There is nothing in my judgment that would be of greater stimulus to loyalty than sincere help and thoughtfulness, especially in time of adversity." "Employees usually appreciate recognition from their superiors, but all too frequently an executive will pat and fondle a nice piece of machinery and not even grunt in response to a 'good morning' from the man operating the machine."[2]

Other Desires to Be Considered.—Other forces that play an effective part in enlisting cooperation and loyalty are mutual trust and confidence, the removal of fears, an opportunity for self-expression and creative ability, freedom from undue supervision, ready access to management, and a reasonable amount of self-determination. C. A. Lee gives an interesting illustration of the effect of one of these.[3] A group of girls occupied in threading needles for older girls who were doing embroidery work had an average record of 96 dozen needles per day. To speed up work, the piece-rate system was introduced, and the average fell to 75 dozen per day. A quota of 100 dozen per day was then set, with the provision that as soon as the quota was completed the girls might leave

[1] Disston, Frank, *Handling Men*, pp. 103–119, McGraw-Hill Book Company, Inc., New York, 1917.

[2] Burtt, H. E., *Psychology and Industrial Efficiency*, p. 291, D. Appleton-Century Company, Inc., New York, 1929.

[3] Lee, C. A., Some Notes on Incentives in Industry, *The Human Factor*, 6: 180–182, 1932.

the factory. The most common quitting time thereafter was 2:30, instead of the customary 5:00.

Such unorganized nonfinancial incentives will operate in different degrees in different industries with a fair degree of assured success if they are accompanied by the following conditions:

a. Absolute confidence of the worker in the sincerity and honesty of management.

b. Individual study of employees by those executives who have most contact with them, in order to discover the factors which interest and appeal to them most strongly and which can be incorporated into the work task.

c. A personal interest in the welfare of each worker, and the adjustment, so far as possible, of company plans and tasks to individual capacities, and conversely the adjustment of individual capacities to positions in the organization which are sufficiently challenging to keep mental activity alive and which are yet sufficiently easy to preclude undue fatigue.

Organized Nonfinancial Incentives

The fundamental interests and motives of the worker cannot always be appealed to by individual treatment. Institutional programs or organized schemes through which the worker is given a chance to realize an expression of some of his stronger interests and urges form a necessary part of a well-planned personnel program. The frequency with which these are found in organizations is shown in a number of recently completed surveys. Table 74 is compiled from data in various tables supplied by a survey made by the N.I.C.B.[1] The survey included 2,452 companies, which at the time the survey was made were employing 4,502,608 persons. Of these organizations 84.6 per cent were manufacturing industries, distributed all over the country.

The importance and value of some of these activities have been discussed in previous chapters; others, *e.g.*, safety programs and rest periods, will be discussed in later chapters. Of the group that remains there are three of sufficient importance to warrant analyses.

Suggestion Systems.—The immediate object of suggestion systems is to give employees an opportunity to submit ideas for improving any aspect of the work situation; the remote hope is that the system will encourage the employees to think about their work and about the types of problem that the company faces, that it will help the company to detect the more promising employees, and that it will provide an adequate avenue for the release of grievances.

Suggestion systems, which have been in practice in organized form since 1880, have had a turbulent career. Successes have been interrupted by failures and enthusiasm by scorn; in some organizations there

[1] See *Report* 221 *of the N.I.C.B.*, Tables 8, 10, 11, 12, and 13, on pp. 15, 17, 18, 20, and 22.

TABLE 74.—NONFINANCIAL INCENTIVE PLANS IN 2,452 COMPANIES

Type of activity	Companies with active plans		Discontinued plans	
	Number	Per cent of employees sharing	Number	Ratio to active plans
Training programs	848	65.8		
Medical service	1,598	93.1		
Dental clinic	113	19.0	27	23.9
Dispensary or hospital	1,154	82.4	7	0.6
First aid, organized	1,330	73.3	7	0.5
Health promotion	366	44.9	6	1.6
Nurse (plant and/or visiting)	1,233	56.2	78	7.4
Optical clinic	179	16.5	18	10.1
Physical examiner:				
New employees	1,124	83.8	33	2.9
Periodic	471	53.8	25	5.3
Physician (part or full time or on call)	1,659	48.8	43	3.9
Safety promotion	1,429	83.1		
Plant conveniences:				
Luncheon facilities	934	72.3		
Parking facilities	1,459	69.6	3	0.2
Cooperative purchasing	268	11.8	27	10.1
Discount on company products	661	40.0	12	1.8
Company or cooperative store	174	24.5	54	29.9
Athletic programs	1,155	71.6	289	25.0
Social programs (clubs, houses, dances, dramatics, music, gardens, picnics, summer camps), varied number of different kinds in different companies. Maximum in one	816	57.0	195	23.9
Holidays with pay	1,933	87.2		
Vacations with pay	2,024	93.6		
Rest periods	343	36.1	10	2.9
Suggestion systems[1]	250	23.1	116	42.5
Company paper or magazine[1]	6	9.2		

[1] The figures for suggestion systems are taken from *Report* 231 *of the N.I.C.B.*, Plans of Stimulating Suggestions from Employees, 1936, a survey of the practices of 366 companies which had been operating suggestion systems. The figures for company paper are taken from H. W. HEPNER, *Psychology in Modern Business*, p. 599, Prentice-Hall, Inc., New York, 1931.

has been a continuous record of satisfactory results, while in others there has been intermittent success; in some there has been an enthusiastic start, followed by neglect, spasmodic efforts at revival, and final discouragement and defeat.

The types of suggestion plan that have been in operation have varied in different organizations; the most common type is the continuous plan,

in which there is no time limit for the submission of suggestions. The N.I.C.B. survey[1] showed this type of plan to be in operation in 84.2 per cent of the 222 companies that were using suggestion systems. Another type, used occasionally, especially in sales organizations, is the contest type, in which a time limit is set for the submission of suggestions, and predetermined rewards are given to those who submit the best or the most valuable suggestions during the period. Many concerns (60 in the above-mentioned report) combine the two plans, using the contest type occasionally as a means of arousing or increasing interest in the established plan.

In the survey of suggestions made by the N I C B , the desired and achieved results that are given in Table 75 were reported

TABLE 75 —SUGGESTIONS ASKED FOR AND RECEIVED

Type of suggestion desired or received	Number of companies asking for this type	Number of suggestions accepted in year	Per cent of total suggestions
Reduction in cost	46	6,899	24 8
Improvement in product	42		
Safety	37	2,190	15 5
Improvement in quality of product	29	2,126	15 1
Improvement in working conditions	14		
Elimination of waste	10		
Plant housekeeping	5		
Increase in sales	5		
Improvement in designs	4	606	4 3
New products	4	483	3 4
Improving public relations	3	310	2 2
Others		1,480	10 5

The suggestions that are offered are determined by the individual interests of employees and by the formulated plans of the committee that is responsible for evaluating the suggestions Mr. Gates of the Eastman Kodak Company (whose system dates back to 1898) recommends[2] that they be classified into definite groups and that the employees be invited to submit suggestions for any group. His grouping is as follows:

a. For improving engineering, construction, operating, manufacturing, or sales methods.

[1] See *Report* 231 *of the N I C B*

[2] DICKINSON, Z CLARK, Suggestion Systems Compared, *Personnel Jour.*, 7: 12–17, 1928, 12. 18–20, 1933–1934, 13 197–203, 1934–1935, and American Trends in Industrial Incentives, *Occupational Psychology*, 12· 17–29, 1938.

b. For improving service to and relations with customers.
c. For improving public relations.
d. For improving office methods and systems.
e. For improving tools, appliances, and machinery.
f. For improving safety devices.
g. To eliminate hazards to life and property.
h. To reduce costs.
i. To prevent waste.

The frequency with which employees make use of suggestion systems has often been surveyed. Dickinson summarizes a number of surveys in seven types of organizations for a 10-year period, 1926–1936.[1] The following table is a summary of his studies.

TABLE 76.—FREQUENCY OF OCCURRENCE OF SUGGESTIONS

Type of concern	Average number of suggestions per 1,000 employees in one year	Average per cent awarded in one year	Average payment per suggestion
Rubber	326	19.5	$12.84
Electrical	182	26.0	6.32
Paper manufacturers	283	21.0	5.75
Chemical	556	24.0	10.95
Public utilities	211	22.0	6.90
Department stores	72	16.0	4.02
Life insurance companies	18	41.0	8.04

The frequency with which the suggestions occur in one company is indicated by the graph in Fig. 15. In this company, the East Springfield branch of the Westinghouse Electric and Manufacturing Company, the suggestion system has been successfully operated for a number of years. For 5 years graphic charts were frequently published, showing the number of suggestions accepted and received and the average award for each suggestion, as monthly totals were computed. The graph in Fig. 15 summarizes these for the 5-year period, 1933–1937, summarizing the totals in 3-month intervals, instead of monthly intervals as issued by the company. The data were supplied by the Director of Industrial Relations, Mr. T. O. Armstrong.

As can be seen from the graph and from Table 76, the percentage of suggestions accepted varied from time to time, varying as low as 6 per cent in some months to as high as 80 per cent in others. The amount paid per suggestion is determined by the method of payment in operation in the plant. Some, for example, R. H. Macy & Company, pay $2 for

[1] *Ibid.*

every accepted suggestion and monthly premiums of $10, $15, and $25 for the three best suggestions; others pay a minimum sum at the time the suggestion is accepted, and supplement that later if returns warrant the increase; still others pay 10 per cent of the estimated savings or returns that result from the suggestion.

The net cash value to the company of the suggestions accepted is not easily estimated. Maurice Denny says, "Not more than six or eight

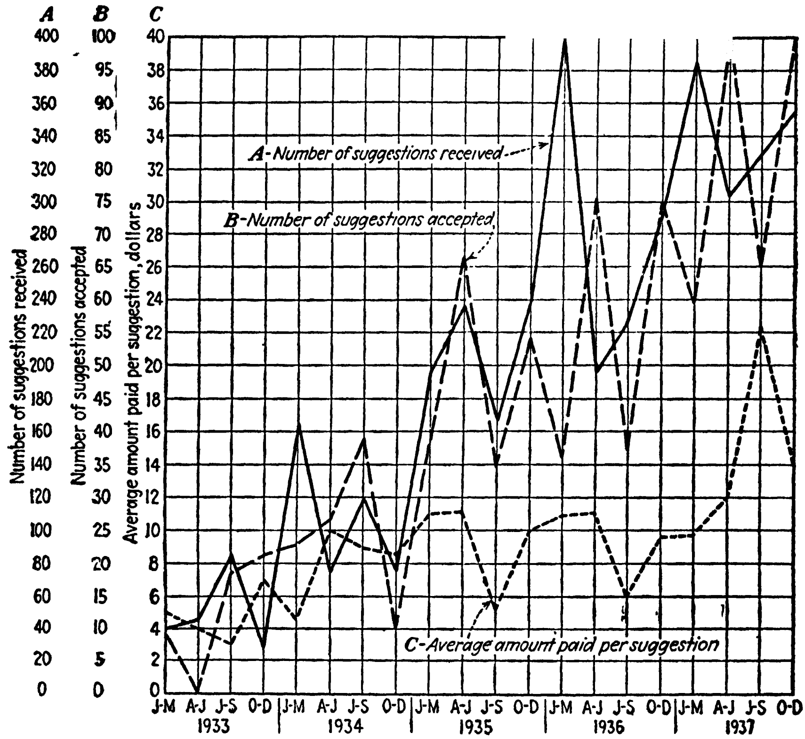


FIG. 15.—Suggestion record for five years at the Westinghouse Electric & Manufacturing Company, East Springfield Division. (*Courtesy of T. O. Armstrong.*)

patents have grown out of our scheme during the fifty years of its operation." Many of the suggestions that are offered have no direct monetary value; in fact, they are more likely to increase the company's expenses, but they add to the workers' conveniences and to the safety of the plant, and are therefore considered to be of value. The estimates that have been made of the cash value of suggestions over a period of time are but guesses, as many of the suggestions are for permanent changes the future value of which cannot be computed. Representative of the value to organizations with active suggestion systems is the estimate of the Commonwealth Edison Company. During a 6-month period, they received

12,500 suggestions, accepted 2,100 of them, paid $16,000 in rewards, and estimated a net saving to the company of $140,000. The extent to which employers think that suggestions have some value is indicated in the summary of the judgments of 231 companies surveyed by the N.I.C.B.[1] Of that number, 76 reported the system as "worth while," 31 reported that the system increased workers' interest in their work, 25 reported that it improved employer-employee relations, 6 said that it helped them to discover hidden talent, 3 said that the system helped to keep the supervisors alert, and 3 reported that it was a convenient outlet for criticism.

In spite of favorable results reported by some companies, many others in which the system had been in operation have discontinued using it. In the N.I.C.B. report, 116 companies were reported to have discontinued use of the plan. Some of the reasons given will indicate the factors that may be responsible for failure.

1. The net value of the suggestions made by the rank and file of employees is not sufficient to cover the total cost of the rewards and of the time spent by those who have to dispose of them. Of the 116 companies that reported having discontinued the practice, 62 gave the poor caliber of the suggestions as their chief reason.
2. The plan generates an individualistic attitude and interferes with the cultivation of a team spirit; cooperation, it is thought, can be more effectively promoted by other plans which require less supervision and which can be left largely to employee control.
3. In many cases, discontinuance was due to the objections and criticisms of foremen, or to their attitude when some member of their department had a suggestion accepted. In some cases, the foremen were accused of stealing the workers' ideas; in others, the foremen thought that they were being side-stepped when the suggestions were introduced; in others, there was the fear that their prestige would be lowered, their inadequacies exhibited, and their security threatened. Some workers attributed their dismissal to foremen's jealousy, and others accused the foreman of unjust attitudes when suggestions helped to earn promotions.
4. Other causes of the discontinuance of the plan were lack of interest on the part of both employer and employee, employee dissatisfaction with results or rewards, committee mismanagement of the plan, and the financially embarrassed condition of the company.

The number of organizations that have been successfully using the plan for a considerable period indicates that it has merit if properly used. Table 77 gives some idea of the extent to which suggestion systems are being used. It is a summary of the results of four different surveys.

With the exception of the 1936 survey made by the N.I.C.B., the surveys were of selected companies. The 1936 survey was extensive enough to indicate the general tendency; 22 7 per cent of the companies were still continuing a plan which in some cases had been in operation for over a quarter of a century. What are the features of such plans, and

[1] See *Report* 231 *of the N.I.C.B.*

TABLE 77.—FREQUENCY OF THE USE OF SUGGESTION SYSTEMS

Year	Author	Number of companies in survey	Number of companies with plan
1926	N.I.C.B.	1,000	210
1931	S. B. Mathewson	192	103
1936	N.I.C.B.	2,452	556
1937	N.I.C.B.	338	222

how should a suggestion plan operate? The following suggestions are based on the experiences of the General Electric Company and Mavor and Coulson, Ltd., Scotland.

1. Publicize the scheme. In the Mavor and Coulson organization there is a special notice board on which the details of suggestion plans and results are posted. In addition, posters are displayed in all departments and a notice, "Have you made a suggestion this week?" appears on every door and in prominent places throughout the works. Also, a slip containing a slogan that has been suggested by the workers and for which the originator gets 75 cents, is inserted in the pay envelopes every week. The result is that 70 per cent of the employees in the Mavor and Coulson plant submit suggestions, with an average of three suggestions annually from every employee, 40 per cent of which are adopted.[1]

2. Secure the cooperation of departmental heads and foremen. A suggestion system will demand considerable time from the departmental chief, and will show up some marked deficiencies in his department; unless he is assured that the scheme will in no way operate to his disadvantage, but will instead bring to light many men of promise in his department, he is certain to be neutral if not antagonistic to its operation. For the foreman, Mavor suggests, "the best policy is to make him the recruiting-sergeant of the scheme and to inspire a spirit of interdepartmental competition as to the numbers of suggestions submitted."[2] Foremen's conferences in which the scheme is discussed, and departmental prizes and special prizes to foremen for beating their own or other department's records help to enlist their cooperation.

3. Supply proper forms for submitting the suggestions. Some companies have a three-part form. Each part has the same number on it, the largest part being reserved for the description of the suggestion, and the smaller parts for the name of the employee and the suggestion number. When the suggestion is submitted, it is first sent to the committee secre-

[1] MAVOR, J. B., and J. B. LONGMUIR, A Successful Suggestion System, *The Human Factor*, 10: 278–283, 1936. See also various numbers of the company magazine, *The Mavor and Coulson Apprentices' Magazine*, 47 Broad Street, Glasgow, Scotland.

[2] MAVOR and LONGMUIR, *op. cit.*, p. 278.

tary, who tears off the parts that contain the name of the employee, and submits the suggestion to the committee.

4. A committee having the confidence of the employees should be appointed to evaluate the suggestions. Usually, three members are sufficient—one elected by the employees, one appointed by management, and one an expert in the field from which the suggestion comes. This third member will be changed from time to time, according to the nature of the suggestions under consideration, an office expert for office suggestions, a chemical expert for suggestions from that department, etc. Before the weekly meetings of the committee the secretary should have collected the opinions of each member regarding all suggestions to be acted upon.

5. The decisions of the committee should be published, either on the company bulletin board or in the company magazine. The magazine of the Mavor and Coulson organization devotes one-quarter of the quarterly issue to the suggestion system; at the time of each issue, every reward is published, the workers who have won special prizes are given a conspicuous place, often their pictures appear in the magazine, and the number of supplementary rewards that have been made is stated.

6. If a suggestion is rejected and shows no promise of having any value, the worker should be given a written explanation; if the suggestion has promise but needs correction, the employee should be given some indication of the direction along which corrections may be made. As part of the same plan, the suggester should have the right of appeal, so that he will not feel that he has been treated unjustly.

7. The awards should be on a predetermined basis if the suggestions have no cash value, and should be in proportion to the value of the idea if they offer promise of savings or returns. In order to ensure justice, the suggestions should be reviewed twice a year, and supplementary payments should be made for those suggestions which, in the opinion of the committee, have proved of greater value than was originally estimated. This plan has a twofold value: the employee is given a surprise in the form of additional reward, and will have a feeling of equality in the discovery that management sometimes makes mistakes in judgment, but is willing to admit mistakes.

8. In the interests of the men who never or rarely submit suggestions, the committee secretary should conduct informal interviews, give explanations of the purposes of the system, help in the formulation of any ideas these workers may have, and help them to explain the suggestion to the department chief.

Suggestions are among the most valuable tools that management can place at the disposal of the employees; if they are properly operated (for this purpose there should be one person who spends all his time on the

scheme), they can be the means of bringing to light unknown talent, of releasing worries, and of making improvements the necessity for which can be known only by the discerning operator who spends the greater part of his waking life on the job.

The Company Magazine.—The first company to introduce a company magazine in this country was the National Cash Register, in 1890. From that date to the beginning of the First World War, increasing numbers of companies published weekly, monthly, or quarterly journals. The number in existence today is given varied estimates. Hepner's survey shows that approximately 9 per cent of the larger organizations have one each, and another estimate places the total number in the country at about 700.

There are numerous reasons for introducing the company magazine; among them the following are of most importance:

a. To make the plant mean something human and personal to the workers; unless there is some common avenue through which group and company activity can be made known, the various activities of small groups may go unnoticed for months, and those who are interested in participating in the activities will have no knowledge of their existence.

b. To give recognition and appreciation to any who are making unusual contributions to the organization. A suggestion system cannot work successfully unless there is a medium through which those who make a contribution can receive the recognition of others; in that respect, the magazine acts as a means of satisfying a universal desire—recognition from fellow men. The care with which copies of magazines are preserved by those whose names or articles appear in conspicuous places should be an indication of the manner in which the tool can become the means of increasing interest in the company and of making it mean something personal to the individual employee.

c. As a means of giving each employee a picture of the organization. Many employees know very little of the company for which they work, its history, the wide use of its products, the position it holds in the industry, the places in industrial organizations filled by some of the executives, or the far-flung contacts which the organization has in different parts of the world. As a means of developing pride in the organization, the magazine can be a more effective tool than any other at the disposal of management.

d. As a means of popularizing a campaign. This may be one that is concerned with reducing accidents, absenteeism, or tardiness; with improving health conditions; or with advertising a newly devised educational plan. Whatever tool management wishes the employee to take an interest in can be more effectively popularized through the magazine than through the medium of "company meetings."

e. As a means of developing fellow workers' interest in one another and of giving people who have very little in common a medium through which to get acquainted. As a means of uniting people for a common purpose and giving them an opportunity for expressing any literary tendencies that they may have, the magazine often brings about the discovery of some who otherwise would be among the "unwept, unhonored, and unsung."

An often-expressed reason for the nonexistence or the dropping of a magazine is the lack of subject matter; a more adequate reason is the

incapacity of the person responsible for the magazine. Among the different types of subject matter most likely to interest the company employees are the following:

a. Items of individual concern to particular employees: holiday experiences, athletic activities, births, marriages, deaths, promotions, stories of individual accomplishments, hobbies, adventures, and the many other varied interests of 1,000 or more different workers.

b. Stories of common appeal, particularly those dealing with personal accomplishment or heroism. In some magazines appear series of articles on the development and history of some of the company's products; the story of the toaster, the electric grill, or the radio can be made as fascinating to the average employee as an account of the latest baseball game.

c. One leading article in each issue. It may be in the form of a discussion of some recent federal legislation, the history of some labor law, or any topic that is uppermost in the minds of many of the workers. As least one article in each issue should have some "meat" in it.

d. Pictures and "funnies." The section to which men readers will first turn is the "funnies," in either illustrated or story form. Care should be taken to avoid fun at any employee's expense; even good-natured fun assumes a different meaning in print from what it has when spoken. Pictures are always a source of attraction; they should occupy from 25 to 50 per cent of the magazine and should be related to phases of employees' interests.

e. Special articles, particularly those relating to health, education, and public welfare. Unusual interest is given to a magazine if sections of it are devoted to special fields, *e.g.*, the home page, the children's page (edited occasionally by high school students who are the sons and daughters of employees), the salesmen's page, etc.

The success of a magazine depends upon the number of enthusiastic people who have become interested in it; their enthusiasm depends upon the ingenuity and capacity of the person responsible for keeping interest in the magazine at a high level.

Company and Cooperative Stores.—The inauguration of a store on the plant or the possibility of purchasing goods at other stores at reduced rates has been one of the most appreciated and least criticized innovations that management has offered its employees. When properly organized, well managed, and freed from the suspicion of "graft" or "rake-off," this readily becomes one of the best agents for creating good will among the employees. At the same time, it is beset with dangers which may easily wreck the scheme and antagonize the public, especially the local merchants, and the employees.

Many plants that have had cooperative or company stores have discontinued them for one or more of the following reasons: (1) competition offered by chain stores, (2) the presence in the community of first-class stores with a great variety of products, (3) the unwillingness of employees to carry purchases through the streets, (4) unfamiliarity, on the part of managers, with efficient buying, selling, and accounting methods.

The problems incidental to the placing of a store at the disposal of employees center around

a. *Management.*—If this is entirely in the hands of the executives of the company, it is difficult to avoid the suspicion that the company is benefiting from its side line; if, on the other hand, management is entirely in the hands of employees, the difficulty of getting a capable manager is sometimes acute. A solution is found in the cooperation of the two, management collaborating with representative employees in organizing and conducting the enterprise.

b. *Capital.*—Frequently the management provides the necessary capital with which to make a start, usually between $2,500 and $5,000, and regards the outlay as a gift in the interests of the workers; sometimes the invested amount is returned, but more often it is left in the organization. In a number of cases, the necessary capital for starting is raised by contributions on the part of a selected number, or a volunteer group, of the employees. The dangers of the latter are obvious; expected returns on an investment in a cooperative enterprise are rarely realized, and even if they are, the profits have been at the expense of fellow workers, who do not feel enthusiastic over profit derived from their purchases.

c. *Location.*—Usually the store is in one of the plant buildings and is thus freed from the expense of heat, light, and rent. If no space is available in plant buildings, an additional tax is put on management. Experience has rarely shown it to be profitable to operate a store as an independent unit when it has to carry the usual overhead expenses of the average store. Securing a location within the plant, where there will be from 600 to 1,200 square feet of floor space fairly central and readily accessible, is not often possible. The result is that the store operates in a basement corner, an unused storeroom, or an inaccessible nook, where it may never be discovered by a number of employees.

d. *Competition.*—Any organization purporting to reduce the cost of goods below local levels is destined to antagonize local merchants and some of their devotees. The resultant ill will for the company acts as a check on employee enthusiasm; for that reason, the goods that are sold produce the least undesirable results when there is a comparative scarcity of them in the community. When staple products are sold, the competition offered by chain stores places exacting demands on the purchaser of a company store, and as a rule he cannot buy them at prices below those at which a chain store sells.

The different kinds of stores or purchasing arrangements that have been in operation are

1. *The Company Store.*—In this case the management provides the capital and overhead and sells goods to the employees at cost, plus a small percentage, usually 10. Dupont has operated one of the most successful of this type at its Deepwater plant, with daily sales often exceeding $3,000. The Dodge Manufacturing Company has a similar type at its Mishawaka plant, with the unusual innovation of requiring its employees to place their orders when they arrive at the plant and take them away in prepared baskets when they leave.

2. *The Cooperative Store.*—In a store of this kind the company usually provides rent, fuel, and light, and sometimes pays the salary of the

attendant; but the management of the store is in the hands of the employees. The American Wool Company operates one of this type. With company-furnished buyer, manager, and sufficient capital, a committee of employees decides on questions of policy. Special sales of articles, giving the quantity available and the price, are announced on the bulletin board and orders are taken in the mills. The Packard Motor Company has a similar store, under the control of a board of seven directors who are appointed by the employees. The Timken Detroit Company has one with capital ($5 each) subscribed by selected employees—married men who have had 6 months of service in the company.

3. *The Company Purchase Plan.*—In this plan the company takes orders from its employees for specially selected products and sends the complete order to a wholesaler. Armour and Company has agreements with a clothing manufacturer, a shoe merchant, and some other producers for such joint purchases for their employees. The Solvay Process Company purchases household necessities for its employees when sufficient orders are on hand.

4. *The Cooperative Purchase Plan.*—This is usually under the control of a committee of employees; it has replaced the company purchase plan in some instances where suspicions had been aroused as to the company's deriving a profit from its plan. In most cases, this plan originates with and is controlled by the employees. The Eastman Kodak Company has an employees' cooperative purchase plan under the direction of representatives from different factories, who have full charge of the policy. Weekly bulletins are posted announcing the commodity that is available —usually one each week—and the combined order is filled with a predetermined wholesaler.

5. *The Company Discount Plan.*—Probably the most widespread economy that companies offer their employees is the plan whereby they may purchase company products at considerable discount. The usual restriction is that the goods bought in this way must be for personal or family use. The Western Electric Company offers such articles as vacuum cleaners, washing machines, and toasters at from 15 to 25 per cent discount. The John Wanamaker stores offer their employees a 20 per cent discount on goods that are bought for their personal use between the hours of 9:00 A.M. and 11:00 A.M.

6. *The Outside Discount Plan.*—Occasionally an outside store is induced to give employees of an organization a discount on their purchases when management promises full cooperation or makes credit deductions from the employees' pay envelopes, or does both. This plan is quite common in mining centers and among educational institutions. Whether it is adopted for either charitable or advertising purposes, it has value for the individual employee and is usually well supported.

How valuable any of these plans are for management is problematical. Any permanent practice becomes habitual, and after the first few months of operation seems to contribute little to the morale of the organization; loyalty to a concern may be enhanced for a short time by such an innovation, but continuance of that loyalty is dependent on other factors than the possible saving of 5 per cent of the weekly food bill.[1]

The whole problem of providing proper motivating forces for a group of people with a diversity of interests and very few common drives cannot be solved by any one panacea; a varied program which gives each person an opportunity to realize some of his major forms of self-expression, which enlists the confidence of every worker, and which serves to extend the boundaries of every employee's activities beyond the scope of his particular task is essential if permanent loyalty to an organization is to be gained and enthusiasm about its endeavors and products is to be kept at a high level.

Topics for Report

1. Review and compare Ordway Tead's *Instincts in Industry* and Whiting Williams's *Mainsprings of Men*. Why are there such differences in the interpretations of what motivates people?
2. Compare the effects of the following motivating forces on college students and salesmen: knowledge of results, competition, praise. Suggest a method of making a comparative evaluation.
3. Make a survey of six organizations and report the frequency with which (*a*) financial, (*b*) nonfinancial incentives are being used. In each case, secure some judgment, and if possible some statistics, showing the value of the different incentives in each organization.

Required Reading

1. HEPNER, H. W.: *Psychology in Modern Business*, pp. 463–497, Prentice-Hall, Inc., New York, 1931.
2. MOORE, B. V., and G. W. HARTMANN: *Readings in Industrial Psychology*, pp. 415–452, D. Appleton-Century Company, Inc., New York, 1931.
3. VITELES, MORRIS: *Industrial Psychology*, pp. 560–585, W. W. Norton & Company, Inc., New York, 1932.

Supplementary Readings

1. DONALD, W. J. (ed.): *Handbook of Business Administration*, pp. 1159–1186, 1633–1654, McGraw-Hill Book Company, Inc., New York, 1933.
2. *National Industrial Conference Board Reports*, 217 and 221, and *Studies in Personnel Policy*, No. 2, The Conference Board, New York.
3. PARKER, C. H.: *The Casual Laborer and Other Essays*, Harcourt, Brace and Company, New York, 1920.

[1] The companies that are mentioned have been quoted from a monograph issued by the Policyholders' Service Bureau of the Metropolitan Life Insurance Company, *A Report on Company and Cooperative Stores*, 1927.

CHAPTER XI

PROMOTING THE EMPLOYEE

Harry F. Porter[1] reports the following conversation between a young workman (W), en route home from work, and a fellow passenger (S), a stranger to the worker:

S: That's a pretty fine place where you are employed.

W: Yes, I guess so.

S: Out here in the country, with beautiful surroundings, the buildings modern and sanitary conditions excellent; I shouldn't wish for any better place if I were a shopman.

W: Oh, it's all right as far as that goes.

S: But there is something you do not fancy about the place? Is it the pay?

W: Well, no; not exactly. They pay you pretty decent. I ain't got much comin' on that score.

S: What is it then that you don't like?

W: Well, it's just this: a feller like me has no chance to get ahead. When there's a good job open, they never give one of us young fellers a show; they always hire in some new guy. I wouldn't mind if none of us could do the work; but they don't seem to care whether we can or not. I'm going to leave as soon as I get a good opening where they give a feller half a chance to get ahead.

"Bringing in some new guy" and "not giving a feller half a chance to get ahead" are two crucial issues confronting the average worker, especially the younger men. Good pay and an agreeable occupation are no longer adequate to keep men satisfied, much less to spur them to put forth their best effort; there must be reasonable opportunity to "get on." If only men can be assured of a future in some degree commensurate with their ambitions, the pay and the working conditions will be tolerated, even when they are nearly unendurable. Promotional possibilities are the seed of the hope of youth: without them ambition is killed, creative expression is dwarfed, and the job is done only for the sake of the pay envelope that ends the weekly work; with them, on the other hand, encouragement is given to the expression of one's best efforts, and justification is at hand for temporary sacrifices, special studies, and enthusiasm over "our company."

NATURE AND IMPORTANCE OF PROMOTION PLANS

Promotion is primarily an advancement to a new position which puts greater demands upon the occupant, requires greater ability, and

[1] PORTER, H. F., *Handling Men*, pp. 127–128, McGraw-Hill Book Company, Inc., New York, 1917.

offers better returns than the position already held. If anyone is to be promoted, there must be a vacancy, and to fill that vacancy there must be a candidate whose experience, training, and characteristics give promise of his being successful. Promotion, it is true, may take the form of a blanket increase in pay because of the return of the day which commemorates one's marriage to the firm, and may not entail any additional responsibilities. That form of promotion, however, is hedged around today with many ifs: *if* the company can afford it, *if* the employee is giving service so much better than he gave a year ago that he merits an increase, *if* the prevailing rate of pay for the job is higher than the occupant gets, and *if* the foreman thinks that the occupant deserves a raise, then advance may be a fair certainty. But this is not the kind of promotion that excites, or even encourages, the worker; he prefers the "ifs" to be part of a larger program and conditioned upon two factors: (*a*) definite possibilities within the organization related to the types of work in which he is now engaged, (*b*) adequate plans within the organization for him to realize these possibilities.

There is no single phase of employer-employee relations which has greater possibilities, and the neglect of which has greater hazards, than an adequate promotional policy. Without one, an organization will fail to hold its desirable workers, will readily gain the reputation of being an inbred or politically controlled concern which it is better to avoid, and will carry the stigma of "pull," "favoritism," and "in-laws" as the guiding forces that determine "who's who" in its setup. With a clearly formulated policy, on the other hand, a strong, efficient, and lasting organization can be built up; labor turnover can be reduced; individual enthusiasm can be maintained; and opportunity can be given for rewarding the individual efforts of those who otherwise would be lost among the cogs of a large machine.

But a promotional policy that is adequate to the organization and satisfactory to the employees is not easy to introduce and, for that reason, is not very common. The most frequent practice in American industries today is to fill a vacancy by having a group of minor executives, or sometimes a lone executive, give a recommendation, based upon general impressions or isolated experiences or inadequate memories of pleasant or unpleasant experiences in contacts with the employee. Without any adequate attempt to study the job and find out the human qualifications necessary to meet its demands, and without any sound knowledge of the most suitable candidates, snap judgments, based on one or two incidents or on production records, determine the result. One easy way out, and one that is now sponsored by the Committee on Industrial Organization, is the filling of an opening with the most experienced man in the division (provided he is a member of a union), assuming

that age and experience are guarantees of adequacy. There are occasions when such a procedure is justified. Other things being equal, the most experienced person should be given the preference; but if this is adopted as a regular procedure, it is a fair indication that no attempt is being made to measure the productiveness or value of the whole force; and the conviction readily develops that age, and not work, will bring its own reward.

The evils of such a system are of three types:

a. The destruction of incentives for self-improvement. With pay promotions automatic, there is no demand for the expression of more effort than the job requires or than is necessary "to keep going."

b. The reduction of production-and-efficiency level to a low average. When age and experience alone condition wage increase, two alternatives confront the above-average worker—either to slacken his pace to the level of the average or to quit. The more ambitious are likely to quit, with the result that the personnel becomes a motley of average and subaverage workers.

c. The difficulty of dismissing an older worker. With annual increases an index of satisfactory performance, the task of finding a reasonable justification for dismissing an unsatisfactory employee is difficult to solve. A progressively increasing wage scale is the employee's best argument for having given satisfactory service.

Another practice, less frequently used in later years, is that of hiring workers from the outside to fill the more important positions. This practice was based on the assumption that familiarity breeds contempt, and that in consequence a coworker could not direct the work of former colleagues; and also on the belief that there was no one in the organization equal to the job. There are times when such situations occur. When an accident or any other factor removes a keyman from a position, and no one has been in training to take his place, or when the organization has gone to seed and no one has any ideas for resurrecting or reviving it, there may be justification for the introduction of new blood. On the other hand, if that is adopted as a general policy, and "new blood" constantly takes the positions for which old employees were in training, loyalty disappears and the company readily acquires the reputation of being a local parasite. If appointments from the outside are made, care should be taken to confide in those within the organization who might have considered themselves candidates for the position, and to convince them of the exceptional demands of the job or the exceptional qualifications of the outsider.

There cannot be an adequate promotional plan unless the following conditions are met:

a. The rates of pay for different jobs should be graded according to the skill and training experience needed, and suitable differentials should be arranged for particularly disagreeable jobs.

b. The organization should have a definite plan of advancement, so that every job has an outlet, and every man knows just what opportunities lie ahead of him, and what additional training and experience are necessary on his part.

c. The basis of promotion should be increased value of the employee to the organization. This cannot be discovered without adequate measuring tools.

d. There should be an adequate training program, within, or sponsored by, the organization, for those who are eager and willing to pay the price of advancement.

IMPORTANCE OF JOB CLASSIFICATION

During the past few years, especially since the development of personnel departments, a number of organizations have built up carefully thought-out promotional policies and schemes, on the bases of which changes in personnel, horizontally or vertically, are determined. An interesting illustration of this is the plan of the American Chicle Company. In their plan every job is classified, and every worker has a title and a rank within the job classification; *e.g.*, chiclet machine operators are ranked as first, second, third, etc., according to seniority and earning ability. If average production level for class is not maintained, the operator is put on probation, and if production continues at a lower rate, she is transferred to a lower rank. If plant operations are temporarily reduced, operators of the lowest rank are the first to leave or to be transferred; if eligible for another position in another department, they are given the lowest rank in that department until work record justifies an advance in rank.

Introducing such a job classification and comparing every job in the organization with every other is the only basis on which sound promotional policies can be offered. Such a plan involves the establishment of different grades, or levels, each one of which demands approximately the same amount of responsibility, and has duties of the same scope, importance, difficulty, and value, without regard to the particular type of work involved. H. B. Bergen, has formulated the following principles, which should provide a basis for grading positions of each class:[1]

a. The scope of the duties and responsibilities of the positions of any given class, as indicated by the specifications and by comparison with others, should be the principal factor that determines its grade.

b. The education, experience, skill, etc., required of the present incumbent of a position in any given class constitutes an auxiliary basis for determining its grade.

c. The skill, efficiency, compensation, etc., of the present incumbent of a position in any given class should have no bearing in determining its grade.

d. The simplest practical grouping of classes that will serve the purposes of the grading plan should be adopted.

[1] Salary Administration and Promotion, *Handbook of Business Administration*, ed. by W. J. Donald, p. 862, McGraw-Hill Book Company, Inc., New York, 1931.

The most important and most difficult task in making such a classification lies in gaining sufficient and accurate information about each position, so that management will know exactly what it demands of the worker. There are three commonly used methods of gaining that information.

1. The Departmental Order-of-importance Method.—This is the easiest to introduce, as it involves the least number of people. The usual practice is for each department head to arrange the positions in his department in the accepted order of their importance, and for a central agency, usually the industrial relations department, to coordinate the department's classifications and divide the joint grouping into a number of grades. The evils of this method are (*a*) it confers with management only in making the divisions, and consequently violates the principle of collective bargaining; (*b*) existing salaries are likely to be the basis on which distinctions are made.

2. The Grade-description Method.—In this method the different grades of work are defined in terms of a number of basic capacities, which function in varying degrees in the different grades. Usually the key positions are described first, and a comparison is made between these and their subordinate positions, from the standpoints of responsibilities involved and training, experience, and qualifications necessary for their successful performance. This method, which is becoming increasingly popular, merits further clarification and illustration. One of the earliest attempts to use it was made by Miss Bills in the Aetna Life Affiliated Companies.[1] All the office positions were divided into nine groups, from the simplest messenger jobs to the most highly technical work, which required special training. A similar classification of office positions, based upon Miss Bills's work, and showing slight modifications, was made by E. H. Little, Supervisor of Industrial Relations in the United States Rubber Company. The groupings that resulted from the descriptions of the different positions are as follows:

I. Work of office- or messenger-boy character.

II. Simple operations. Use of a few definite rules. Routine operations performed under close supervision.

- *A.* Simple clerical work requiring no experience, or work requiring training but no experience, on simple machines, such as sorting, key-punch, ditto, and adding machines.
- *B.* Simple clerical work, requiring some experience to perform the job satisfactorily.
- *C.* Outside training, but little experience, on more difficult machines, such as typewriter, nonlisting calculator, multigraph, etc.

[1] Bills, Marion A., A Method for Classifying Jobs and Rating Efficiency, *Jour. Personnel Res.*, 1: 384–393, 1922–1923.

III. Work requiring recognized clerical ability. Application of a large number of rules, definite and specific; or considerable experience on machines listed under II *C*.
   A. Requiring recognized clerical ability, but the exercise of no definite responsibility, either because of the character of the work or the closeness of the supervision.
   B. Experienced operators on the following machines: typewriters, non-listing calculators, bookkeeping and tabulating machines.
   C. Work of III *A* character but of a more responsible nature.

IV. Work requiring complete and intensive knowledge of a restricted field.
   A. As above III.
   B. Work of IV *A* grade plus supervisory responsibility of a minor character.

V. Work requiring knowledge of general policies; command of general rules and principles with application to cases not previously covered and which may require long experience with the company.
   A. Work of the above character where experience is not necessarily long but must have been gained within the company.
   B. Work of a more technical or more difficult character, but experience not necessarily within the company.
   C. Work of V *A* grade plus supervisory responsibility.
   D. Work of V *B* grade with long experience with the company, or work of IV grade which is not subject to check, and therefore where the promotion of the employee is generally undesirable.

VI. Work of a highly technical nature or of a confidential or semiexecutive supervisory character.
   A. Highly technical or confidential.
   B. Semiexecutive and supervisory in character.

The difficulty with such a classification is its lack of specificity among the different grades, and the consequent lack of meaning that it has for the different workers whose promotional possibilities are determined by it. To tell a worker that his position involves the "application of a large number of definite and specific rules," and that the position of a fellow worker involves "command of general rules and principles with application to cases not previously covered," gives him no idea of the relation between the two positions, or of the qualities necessary for the second position, or of the kind of training through which he must go in order to get to his desired goal. It was this lack of specificity that led to a modification of the method and a complete grade classification of all the positions in their organization by the Pittsburgh Division of the Westinghouse Electric and Manufacturing Company. With their permission, their method is given, in fair detail,[1] in summarized form. The Industrial Relations Department made a classification and grouping of all the salaried positions, from the lowest to the highest, including every salaried worker in the organization, on the basis of the extent to which their work involved the following seven factors: difficulty

[1] *Industrial Relations Manual*, Salaried Employment Policy, Position Analysis and Classification, Westinghouse Electric and Manufacturing Company, August, 1936.

of work, volume of work, responsibility incurred, supervision required, supervision of others, experience demanded, and knowledge or special training necessary. The method used and the results gained are worth reporting, as they give a good illustration of the task involved in making a workable job classification. Their successive steps were the following:

I. The first step was the gathering of information. For that purpose a card was devised asking for a report of (*a*) duties (daily, periodic, and occasional), (*b*) amount of supervision of others, (*c*) contacts both within and without the organization, (*d*) equipment used (if any). This card was completed by each worker, and on the reverse side, the personal, educational, and service record of each worker was filled in by the personnel department. Every worker, from the president down, completed the cards. (The unreliability of this method has been discussed in the previous chapter.)

II. The department heads then reviewed the cards, and made necessary corrections in job descriptions. Their preliminary experience justified their asking two levels of superintendents to review the cards, and with the assistance of the departmental manager and the industrial relations representative, the cards were assembled and arranged according to position.

III. The descriptions were then reviewed, edited, and condensed, so that all who did the same work had the same position description. A standard position description was adopted.

IV. These position descriptions were then tentatively arranged according to the value of the work, from the lowest to the highest, on the basis of the degree in which any or all of the following six factors played a part: (*a*) difficulty of work, (*b*) volume of work, (*c*) responsibility involved, (*d*) supervision required, (*e*) supervision of others, (*f*) experience, knowledge, and training necessary. In consultation with each department manager, the position descriptions for each department were arranged in the order of their importance; and in departments in which there were similar positions, the different managers conferred with the personnel department in making the classification.

V. The lists of positions found in related departments were integrated into a composite list, in which all the positions are arranged in order, from the highest to the lowest.

VI. The separate composite lists from related departments were then compared, and the jobs with similar degrees of responsibility and necessary experience were grouped together.

The result of the study was a division of all the positions into the following seven classes:

a. Unskilled.—"The job is the accomplishment of assigned tasks in an established routine fashion. To function in these jobs, accuracy and dependability are necessary, but neither experience nor training is required."

b. Skilled.—"The tasks require discrimination and choice, technique of hand or brain, and often artistry."

c. Interpretative.—"The function is to meet, classify, and cope with situations clearly recognized as within the scope of the established system. These things are done by applying the standards created in the higher groups. Those who function in this group must clearly see the situation in hand, and fit it into the established pattern. The work may involve secondary executive responsibility for the control of the efforts of large or small groups of workers."

d. Creative.—"The function is that of the creation of material values. The positions call for familiarity with techniques and a breadth of conception of their application, and withal the ability to discriminate and choose or reject. They observe phenomena by study of a manifold of situations, and collect data for the construction of patterns for use in formulating general procedures, thereby establishing standards of practice. Their influence extends downward in the organization, carrying with it the tone of superiors, and upward to those superiors, influencing the tone and character of the executive instructions that are promulgated in those higher groups to set policy in action. Under their technical leadership, the operation of the creation of things is carried out by the hourly paid worker, the integrated result of which effort is to be recognized on this level. However, the individual hourly paid jobs are of the skilled and unskilled groups. The function of the staff supervisors and engineers of this group is the accomplishment of that integration."

e. Executive.—"The function is to translate plans into action by the control of the direction in which those of the lower group will apply their efforts, and the interpretation to them of the meaning or intent of the policy or procedure. They advise with superiors on policy and procedure, reflecting to them broad knowledge of, and experience with, operating conditions."

f. Administrative.—"The function is to administer the broad manufacturing responsibility, universally, functionally, or within a prescribed division of the manufacturing organization. By negotiation and arbitration to bring into harmonious arrangement individual and divergent interests. Promulgate general rules and procedures for the manufacturing organization as a whole, or within the limits of jurisdiction. Shape broad plans and apply them. The position involves executive responsibility of the first order for large or small groups of subordinates depending upon the sphere of activity."

g. Policy Making.—The group responsible for the over-all functions and relations of the company, for the review of unusual and difficult situations; the bringing into harmony by arbitration and negotiation of the divergent and discordant interests of individuals, departments, and the company; the promulgation of general policy and procedure; the exercise of critical judgments, and the administration of law requirements.

It will be noticed that six criteria were adopted in describing each job, from the lowest paid worker to the vice-president, and that in terms of varying demands on the worker of any or all of these criteria, the various jobs were defined, classified, and interpreted in relation to one another.

3. The Job-rating Method.—In this method a scale is constructed in which a certain number of points are allowed for each element into which all the positions are to be analyzed; the sum of the points that are estimated as representing a particular position gives an index of the relation of that position to others in the organization. E. H. Little says:[1]

There is no question but that it presents the correct approach to the problem. It is the only objective, scientific method in a field which in the past has been

[1] LITTLE, E. H., Assistant Supervisor of Industrial Relations, United States Rubber Company, Some Considerations in Installing a Salary Administration Plan, *Handbook of Business Administration*, ed., by W. J. Donald, p. 1150, McGraw-Hill Book Company, Inc., New York, 1931.

governed by only three factors—circumstance, opinion, and the law of supply and demand. It is an invaluable aid to analysis, forcing the raters to consider each element of the position, and to form and record the impressions of the importance of that element.

TABLE 78.—ELEMENTS IN OFFICE POSITIONS

Quality	Value	Interpretation
1. General education	6	The degree of general education, attained through school or individual study, necessary to give background for all-round performance in the position
2. Special training and experience	8	The amount of training in special courses, and experience in previous positions required by the position in question
3. Special knowledge	6	The amount of specialized knowledge of the functions of the department required to perform the work
4. Accuracy and system	6	The necessity of accuracy in copying, posting, checking, or machine operation, and the need for system and neatness in the performance of the work
5. Ability to plan, execute, and accept responsibility	8	The extent to which the position required the ability to plan for self or others, to carry out policies, and to be responsible for results
6. Supervisory ability	4	The degree to which successful performance in the position requires the ability to direct others and to obtain their cooperation for the attainment of results
7. Judgment	6	The degree to which position requires the use of discriminating judgment and the ability to arrive at logical conclusions
8. Mental ability	3	The mental alertness necessary to sense the significance of facts and situations, or to grasp and remember a multitude of details
9. Ability to make good contacts	4	The extent to which position requires a personality which can make a prepossessing impression for the department or company
10. Integrity and professional ethics	4	The degree to which position requires a person whose integrity has been proved, and whose discretion regarding people and things can be depended upon

In view of the expectations from this method, two illustrations of its use will be given, one from the United States Rubber Company, and the other from the General Electric Company. The disadvantages incident to its use will be discussed later.

The United States Rubber Company, "after considerable study," selected 10 elements, degrees of which are found in most office positions; defined and evaluated each element; and then placed each office position in a hierarchal scale, from office boy to office manager. Thirty-two different rates were being paid 32 different types of office positions over and above that of office boy. "On this basis we distributed to the

different elements of the rating scale a given amount of money ranging from 0 to $38 per week, depending upon the position in question."[1] Thus a rating scale was constructed for each of 32 jobs, and on its basis the remaining 160 odd jobs were measured in terms of the demands they made on each or all of the 10 elements. The scale is given in Table 78.

Regarding the value of this scale Little says:

> It has worked. It has seemed to hit the bull's eye in a remarkably large percentage of cases. More important still, it has provided a means for us to record with extreme definiteness our impression regarding the elements of the position at the time when the position was being subjected to the closest study and analysis . . . it has provided the means for checking the correct classification of the positions according to the grade description. It has immediately indicated discrepancies, suggesting the need of further check.[2]

The General Electric Company's plan[3] is the result of a complete job analysis of representative jobs, not only in their own plants but also in related industries. The results from these analyses were reviewed by a number of executives, foremen, and supervisors, each of whom was asked to estimate the factors in the different jobs of different pay levels that placed the greatest demand on the worker. The consensus of opinion was that the six factors listed in Table 79 were the most important variables that were responsible for differences in rates of pay and degrees of responsibility. In some jobs one or more of these factors may be of minor importance, in others they are the most significant. To allow for these variations, each factor was given a point value, varying from 50 to 400 points for the different factors, and the part that each element played in the job was empirically decided and given a numerical value. Table 79 gives each of the factors, their value, and the interpretation given to each.

In order to determine the relative importance of the different jobs, a number of jobs representing the high, medium, and low values of each characteristic were selected and given weights, which were agreed upon by a number of judges as commensurate with the demands of the various jobs. A base rate of 400 points was added to each job value, and the resultant total was the point rating of the job on a daywork basis. Table 80 gives representative values assigned to different types of work.

The 0 point assigned to a characteristic does not mean that the job places no demand whatever upon that factor—any job requires an individual "with a coordination of mind and body and a normal sense of

[1] *Ibid.*, p. 1151.

[2] *Ibid.*, p. 1152.

[3] Given in a mimeographed report, *Job Evaluation*, issued by the General Electric Company, May, 1936, and quoted with permission.

TABLE 79.—FACTORS IN DETERMINING JOB VALUES

Quality	Total value	Interpretation
1. Mentality *M*	100	The capacity necessary for training and for the acquisition of the necessary skill and knowledge that the job normally demands
2. Skill *S*	400	The ability to apply knowledge; the degree of skill necessary on any job should be reasonably proportionate to the length of training and experience necessary for an individual of given mentality to acquire the desired qualifications
3. Responsibility *R*	100	The degree of responsibility involved in a job depends upon the hazard of error and its probable cost. A high degree of mental alertness and coordination of mind and action are necessary when the chance of error is great and probable cost is high
4. Mental application *MA*	50	The continuity of mental concentration and conscious detailed mental direction of physical effort. On simple highly repetitive jobs, mental application is reduced to a minimum by the development of a habit cycle of the motions involved; while on the developmental jobs involving close tolerances and complex mechanisms, mental application would be high
5. Physical application *PA*	50	The physical exertion called for on a job and the degree of continuity of such effort
6. Working conditions	100	This is a minor factor except in such occasional situations as involve hazards to health or clothes, hazards of injury, or exposure to disagreeable conditions

TABLE 80.—POINT VALUES OF REPRESENTATIVE JOBS

Job	Points						
	M	*S*	*R*	*MA*	*PA*	*WS*	Total
Gateman, directs visitors	35	60	25	20	0	0	540
Machinist, 3d, ordinary repairs	50	200	35	10	30	10	735
Milling machine, fractional	25	120	15	10	15	5	590
Assembly conveyor, simple	10	40	0	0	30	0	480
Toolmaker, 1st, compl. jigs	90	320	50	40	20	0	520
Sandblast room, castings	10	60	15	10	50	100	645

responsibility"—but it indicates the relative unimportance of that quality in the total job situation.

The value of a classification of positions in an organization by the use of either the grade description or the job-rating method or by a combination of both is beyond question. Without such a classification

it is impossible to make satisfactory transfers, to eliminate departmental lines, or to give satisfactory promotion; without it, no officer can tell *from* or *to* what occupations workers should be promoted. With a well-publicized classification, the ambitious worker knows his opportunities, and management gives recognition to the aspirations of employees.

Which of the two methods is the better depends upon a number of factors; no one using either method professes having reached perfection. The inadequacies of the grade-description method can be partly overcome by repeated editing and control, but when much elimination is practiced, there is very little left beyond management's interpretation of the job demands, and one wonders what value and justification there is for the time and effort necessary to collect workers' descriptions. The job-rating method is of necessity arbitrary. The division of jobs into five, six, or any number of classes will vary from organization to organization, and will depend primarily upon the predilections of the person making the classification. One need but compare the elements in office positions suggested by Little and given in Table 72 with the classification offered by Nichols and given in Table 44, Chap. VI, to see the dissimilarity resulting from the analysis by different people. The same contrasts are apparent in an analysis of any type of occupation; the result is the product of hypothetical differentiations, which may or may not be important. Another difficulty in the job-rating method is the assignment of relative weights to the different qualities, in the first place, and to the varying importance of these qualities in different jobs, even when a group of judges decides upon their value. It is true that each item can be weighted, but that cannot be done until adequate tests of the different qualities have been administered—a task which those responsible for job classification hesitate to undertake.

The use of the psychographic technique suggested by Viteles gives promise of overcoming the inadequacies of either the grade-description or the job-rating method; trained analysts observing each operator and checking each item of importance ought to be as effective in making human analyses as efficiency engineers are in making time and motion studies. That technique is discussed in more detail in the latter part of this chapter.

In order that job classification shall be effective, two additional measures are necessary: (*a*) there must be an adequate training program; (*b*) the employees must be informed of the possibilities their several positions offer. The solution of this latter measure is not a difficult one. It is an easy task to break down the composite functional program into as many units as there are "jobs with a future," and to present each incumbent of each job with a diagrammatic representation of what the job offers and what steps are necessary, in the form of training, production

record, and personality qualifications, in order that the worker may be eligible for the advancement.

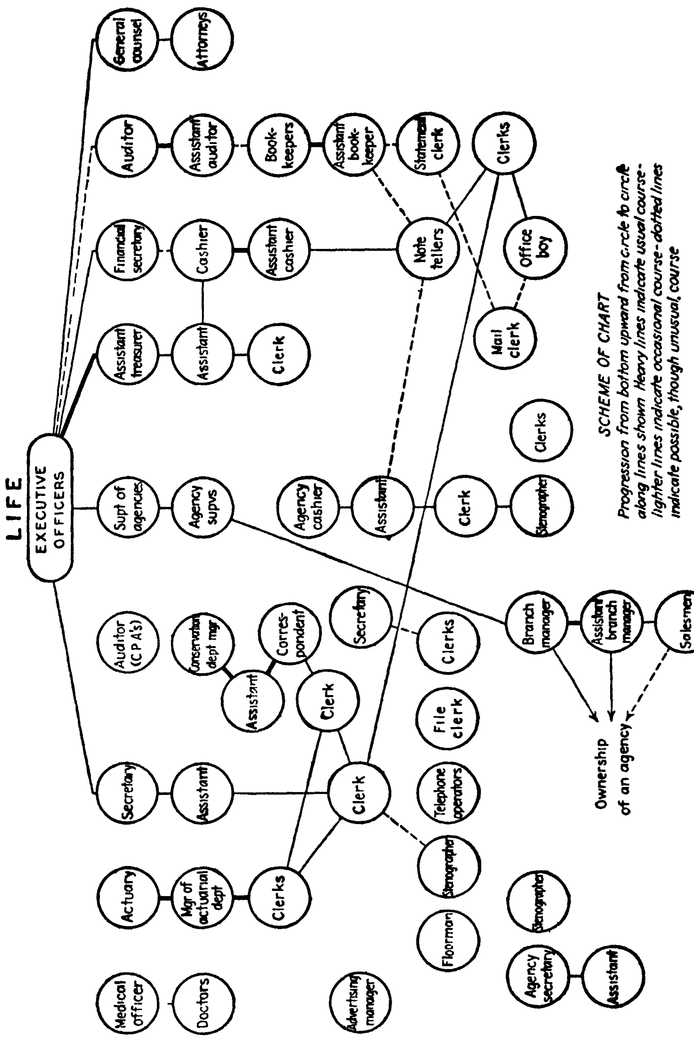


FIG. 16.—Promotion chart. Insurance as a career. (*Courtesy of The Institute for Research Devoted to Research in the Professions and Vocations, Chicago. Copyright, 1932.*)

Figures 16 and 17[1] illustrate the promotional steps in two different types of work. Figure 16 illustrates the normal promotional possibilities in a life insurance company. It will be noted that there are "direct"

[1] Figure 16 is taken by permission of the publishers, The Institute for Research, Chicago, from *Promotion Chart, Insurance as a Career*, 1932. Figure 17 is quoted by permission of the publishers, McGraw-Hill Book Company, Inc., New York, from W. D. SCOTT, R. C. CLOTHIER, S. B. MATHEWSON, and W. R. SPRIEGEL, *Personnel Management*, 3d ed., p. 141, 1931.

as well as "cross" promotional possibilities, and that there are "blind-alley" jobs, *e.g.*, floorman, that lead nowhere. Figure 17 represents the possibilities for one of the least skilled positions in a paper manufacturing concern, roll boy. It shows how an employee, beginning as a roll boy, can rise from that job through the different steps to the responsible position of machine tender, and also gives the maximum and minimum

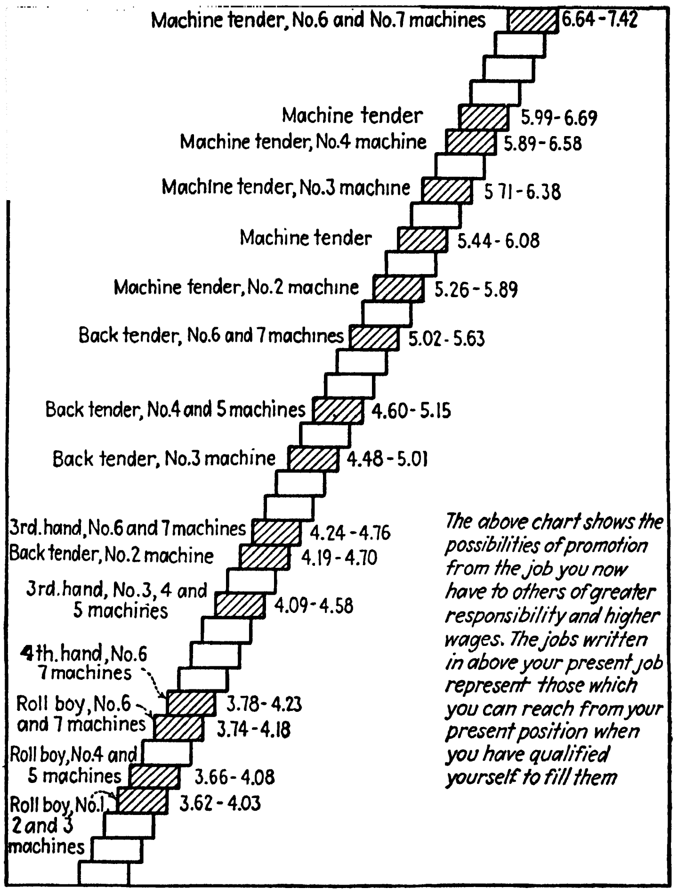


FIG. 17.—Promotional possibilities for roll boy. (*After Scott, Clothier, Mathewson, and Spriegel, Personnel Management, p.* 149.)

rates of pay on each job to which he may be promoted. Similar charts, possibly in greater detail, showing interdepartmental relations and possibilities, can easily become part of the permanent equipment of any job. Without some such tool, the incumbent has very little opportunity to get accurate information on what he should do to get ahead, what training he should take, what qualities he should develop, and what habits and idiosyncrasies he should abandon.

CONTRIBUTION OF JOB ANALYSIS

Promotional charts that develop from existing organizational structures are rarely formulated in terms of the demands that jobs place on individuals; they are frequently determined by job proximity and by past promotional experience. In order that promotional charts may be developed in terms of increasing difficulty of the task and increasing demands on similar or related individual capacities, they must be based on job knowledge. The only way to get accurate knowledge of jobs is by an examination of the daily and periodic duties of the job, by summating these duties into job descriptions and job requirements, and by translating that summation into qualitative and quantitative human demands.

The awareness of the significance of job analyses as a tool for the development of adequate promotional charts has been responsible for their having become an essential part of the function of many personnel departments.

The N.I.C.B. reported in 1931 that, out of 6,000 concerns that were circularized, a total of 2,500 were making use of job analysis as a normal part of their internal practice;[1] according to its report, also, at that time the Personnel Classification Board of the federal government had analyzed and classified the positions, both field and departmental, occupied by some 105,000 people in the federal service, covering activities that comprise almost every form of human behavior. The work that was started by that board has been extended to nearly every other phase of government activity, until today there are job specifications provided not only for so-called federal jobs but also for most types of work on which the welfare and protection of the country depend.

What Job Analysis Is.—Job analysis has been defined narrowly as "the systematic survey, examination, evaluation, and recording of the various components of the job," and more broadly as "a scientific study and statement of all the facts about a job that reveal its content and the modifying factors that surround it."[2] It should be distinguished from the three other modes of procedure that follow here:

1. *Job classification, i.e.*, the segregation into groups, under common designation, of all positions requiring similar skills, training programs, and abilities and having approximately the same relative value to the industry.

[1] *Job Specifications as a Basis for the Operation of Employment Exchanges: A Project in Job Analysis*, a mimeographed report issued by the Social Science Research Council, April, 1932, p. 2.

[2] TEAD, O., and H. C. METCALF, *Personnel Administration, Its Principles and Practice*, pp. 250–251, McGraw-Hill Book Company, Inc., New York, 1926.

2. *Hiring specifications, i.e.,* a record of the essential requirements for each job, necessary for the proper selection and placement of an efficient worker. Job analysis is necessary and prior to both job classification and hiring specifications.

3. *Occupational classification and analysis,* which is usually concerned with the training and trait demands of an occupation, supplemented by a statement of its customary duties, working conditions, and rewards; it describes a general situation, whereas the job analysis is concerned with a particular job in a particular concern. Typical occupational descriptions are provided in such *Guidance Leaflets* on selected occupations as the Department of the Interior issues from time to time, and in the series of monographs, *Careers,* issued by the Chicago Institute for Research. An outline of the form followed in occupational descriptions is given by Scott, Clothier, Mathewson, and Spriegel.[1] The study is divided into two parts:

a. A description of the work, its nature, name, customary location, duties, conditions (time, posture, speed, accuracy, degree of automaticity, health and accident hazards, and disagreeable features), its method of pay, its relation to other occupations, and its sources of supply.

b. A description of the worker, the preferred sex, race, nationality, physical qualities, education, experience, skill, linguistic ability, and personal, mental, and emotional assets and liabilities.

These occupational descriptions are primarily for vocational guidance purposes, and usually include descriptions of the kind of training necessary, the cost of such training, the places where it may be gained, and the probable future of the occupation.

Job analysis, owing to the activities of such mechanical engineers as Taylor, Gantt, Barth, the Gilbreths, Bedeaux, and Segur, has been concerned with the operations of one job in one place, and has been used as a means of eliminating poor and unnecessary methods, setting time limits, establishing an easily acquired method of carrying on the operation, and formulating the demands, hazards, and opportunities it places before the worker, so that the man most capable of doing it in the one best way may be selected.

FORMS OF JOB ANALYSIS

The task of analyzing a job has been performed in a number of ways. Of these, the three forms most commonly used are analysis by time and motion study, by job description, and by the individual psychographic method.

[1] SCOTT, CLOTHIER, MATHEWSON, and SPRIEGEL, *op. cit.*, pp. 116–117.

Job Analysis by Time and Motion Studies.—The form of analysis most widely used and longest established is that making use of time and motion studies. Scientific management had its birth in time studies. Through the notoriety given the work of F. W. Taylor[1] in selecting one man, Schmidt, in the Bethlehem Steel Company, and training him to load 47 instead of 12½ tons of pig iron per day, a new tool was introduced into industry, and has since, in varied forms, been the basis on which piece rates are set and production schedules paced. The tool is time and movement study, especially, at first, time study. By means of this technique the job analyst lists the successive movements or tasks in a job, records the amount of time necessary to perform each movement, compares that with the time taken by other employees to do the same task, and sets as standard the time required by the more skillful workers on the job. On the basis of its findings, piece rates are set, training methods are established, rest pauses are fixed, and the work situation is so arranged that the successive operations can be performed in the most easily learned manner, with the greatest speed and the least expenditure of energy.

The Taylor Method.—Taylor classified time-study work in two groups:

a. *Analytical work,* in which he suggested
   1. Dividing the work of a man performing a job into simple elementary movements.
   2. Picking out all useless movements and discarding them.
   3. Studying how each of several workmen makes each elementary movement, and with the aid of a stop watch selecting the quickest and best method of making each elementary movement in the trade.
   4. Describing, recording, and indexing each elementary movement with its proper time, so that it can be quickly found.
   5. Studying and recording the percentage which must be added to the working time of a good workman to cover unavoidable delays, accidents, interruptions, etc.
   6. Studying the percentage which must be added to cover the newness of a good workman to the job.
   7. Studying and recording the percentage of time that must be allowed for rest and the intervals at which rest must be taken in order to offset physical fatigue.

b. *Constructive work*
   1. Add together into the various groups such combinations of elementary movements as are frequently used in the same sequence in the trade, and record and index these groups so that they can be found easily.
   2. From these several records select the proper series of motions which should be made by a workman in making any particular article and, by summing the times of these movements and adding proper percentage allowances, find the proper time for doing any type of work.

[1] TAYLOR, F. W., *Principles of Scientific Management,* pp. 40–41, Harper & Brothers, New York, 1917.

3. Analysis will always reveal many of the conditions surrounding and accompanying work to be defective, *e.g.*, improper tools, unsanitary conditions. Such knowledge leads to constructive work of a high order.[1]

The introduction of this technique has led to the development of training schools for time-study men, and the establishment of a new profession. The increased production which its usage would bring to industry has not been completely realized.

Opposition to the technique has been in two directions:

1. Labor has objected to what it regards as the sole value of time studies, *viz.*, slight possible increase in pay at the expense of an excessive speeding up of movements, and it resents the point of view for which, mistakenly or not, Taylor gets the credit, of regarding the worker as a shirker whose time has to be regulated with mechanical precision throughout the whole working day, and whose increased efforts can be aroused only by monetary incitements. With that, there is naturally resentment against unsolicited inquiries into one's behavior, especially when these are made without consulting the operator, or gaining his permission and cooperation.

2. Taylor's selection of his standard was in terms of time unit per operation of the most efficient worker in the plant; his objective measure of efficiency was "the amount of work done in a unit of time, or the amount of time required to perform a unit of work," and when that maximum was found, or developed through training and the introduction of carefully controlled rest pauses, it was established as standard for that particular job. His failure to consider the time-unit performance of the average worker, and his refusal to include the human element in the whole situation from any other respect than rate of production, has led to its being dubbed as the "force system," the "stretch-out system," and other epithets which have damned it in the eyes of the critical worker.

The Gilbreth Method.—Modifications of Taylor's system have flourished. One of the earliest was not so much a modification as it was a substitution of Taylor's basic idea—time per unit—for an equally basic one—motions per operation. Sponsored originally by the Gilbreths[2] and introduced with annually increasing frequency in numbers of operations, it professes to offer "both an attitude of mind and a philosophy of work." As a philosophy of work,

[1] TAYLOR, F. W., *Shop Management*, pp. 123–126, Haper & Brothers, New York, 1911.

[2] GILBRETH, F. B., *Motion Study*, D. Van Nostrand Company, Inc., New York, 1911; (with L. M. GILBRETH), *Fatigue Study*, Sturgis & Walton, New York, 1916, and *Applied Motion Study*, Sturgis & Walton, New York, 1917. See also GILBRETH, L. M., Time and Motion Study Techniques, *Occupations*, 12 (No. 10): 35–38, 1934.

. . . it looks upon man as the center of creative activity, and thinks of tools, machines, and power as enabling him to accomplish more, with less effort and fatigue, and with more interest in his work and in what it accomplishes . . . it is interested in looking for causes of effectiveness in work . . . it covers a belief in individual differences and individual responsibility to use one's assets and compensate for one's handicaps by cooperating with others for the common good . . . it thinks in wholes as well as in parts . . . and understands that production cannot be considered alone, one must think back to design and raw materials, and forward to final use and disposal.[1]

As an attitude of mind the Gilbreth method looks at work as a combination of motions whose results can be measured in terms of production, skill, and consequent satisfactions. It is not necessarily concerned with the shortest or quickest motions or with those motions least wasteful of energy so much as with "the one best way" for the best available worker, with the best material and tools, and under the best working conditions, to perform the operation. As a method of job analysis it has developed a technique all its own, the successive steps of which are as follows:

a. Find out if the study is worth making; will anything be gained by it? If it is worth doing, state the problem clearly and in detail so that one may determine how much motion study is necessary, and how much time, effort, and money the study justifies. What are the assured and the probable or possible savings?

b. Make a record of the present practices of doing the job; if obvious changes for the better are apparent, make these before starting motion study.

c. Draw, photograph, and diagram the workplace, and on it set down the various steps through which the work passes, noting variations in these steps by different workers.

d. Develop the *process chart*, using the *therblig* symbols in order to keep the elements of the motions and the possible economies in mind. The chart presents the problem in simple, easily learned, and understandable visual form; it saves the necessity of long transcriptions of procedure, and enables one to see the details in relation to one another and to the whole.

e. The therbligs—to which symbols, names, and colors are given—are actually divisions of the complete motion cycle. These divisions are not motions; they are elements in the whole work picture. The Gilbreths name 17, and claim that any further addition will be due to dividing one of these units. The therbligs are given in Fig. 18, page 310.

f. From the process chart determine what degree of detail study is necessary. Time studies, using the stop watch, may be made on jobs that are of short duration, involve few people, and need only a record of the work method rather than a study of the motions. If a record of motions and exact times, or a simultaneous record of time and motions is needed, the *micromotion* method should be used. In this, the best workers in the group should be selected for filming. From observation and work records, select those with excellent work histories, as well as the reputed lazy ones (they often develop efficient methods in order to avoid work), and film every

[1] GILBRETH L. M., Time and Motion Study Techniques, *Occupations*, 12 (No. 10): 35, 1934.

good motion cycie of each selection. The motion-study film should be accompanied by the use of a *microchronometer*, which gives readings of two-thousandths of a minute,

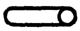
Symbol	Name of symbol	Symbol colors	Name of color	Name and number of pencil
	Search		Black	Dixon black #331
	Find		Gray	Gray #352½
	Select		Light gray	#352½ applied lightly
	Grasp		Lake red	Lake red #321½
	Transport loaded		Green	Green #354
	Position		Blue	Blue #350
	Assemble		Violet	Violet #323
	Use		Purple	Purple #323½
	Disassemble		Light violet	Violet #323 applied lightly
	Inspect		Burnt ocher	Burnt ocher #335½
	Pre-position		Sky blue	Sky blue #320
	Release load		Carmine red	Carmine red #321
	Transport empty		Olive green	Olive green #325
	Rest for overcoming fatigue		Orange	Ruben's crayola orange, dixon orange #324
	Unavoidable delay		Yellow ocher	Yellow ocher #324½
	Avoidable delay		Lemon yellow	Lemon yellow #353½
	Plan		Brown	Brown #343

FIG. 18.—Symbols, names, and standard colors for the Gilbreth therbligs. [*After Mrs. Gilbreth. Quoted by permission from W. J. Donald (ed.), Handbook of Business Administration.*]

and so makes possible the recording of not only the motion cycles and their times, but the therbligs, or elements of motion cycles, and their times.

g. Supplement the film's inability to record a motion path by projecting the film on a cross-sectioned background, and tracing with a pencil the path of the motion

in two dimensions. Or, when feasible, attach a minute electric bulb to the hand, finger, or other moving part of the worker, and photograph, preferably with a stereoscopic camera, the path of light as it moves through space, thus providing *cyclegraphs*. If timing is needed, a *chronocyclegraph* can be made, showing the path of the motion, the time, the direction, and the speed.

h. Each frame of the film containing data that may be valuable in determining the standard method of doing the work should be studied, and the data transferred to a simultaneous motion-cycle chart, a *simo-chart*,[1] which gives a record of the elements of the motion cycles—therbligs.

i. By comparing the therbligs in a number of simo-charts, and synthesising the best therbligs from all the charts, a tentative *standard method* is built up. The completed chart contains the best practice of each of the group of workers studied, and combines them into a work method. This standard method must use the rules for motion economy and efficiency, which are[2]

1. Both hands should preferably begin their therbligs simultaneously.
2. Both hands should preferably complete their therbligs at the same instant.
3. Both hands should not be idle at the same instant, except during rest periods.
4. Each of the 17 subdivisions of various kinds of work has a proper range of elapsed time in which it should be performed. While this differs for different people, correct standards from which to deviate should be established.
5. Motions of arms should be in opposite and symmetrical directions, instead of in the same direction, and should be made simultaneously.
6. Hesitation must be analyzed and studied, and its cause accounted for and, if possible, eliminated.
7. Shortest time demonstrated in one part of study should be used as a mark to attain, and the reason for other times required in other parts should be known.
8. Number of therbligs required to do work should be counted, for the one best way is almost always the sequence of fewest therbligs.
9. The best sequence of any therbligs in any one kind of work is useful as suggesting the best sequence in other kinds of work.
10. Every instance where delay occurs suggests advisability of providing some optional work that will permit utilizing time of delay, if so desired, or making fatigue study of the interval.
11. Variations of time required for any single therblig should be arranged and the causes recorded.
12. Lateness of various parts of the anatomy as compared with other portions should be recorded.
13. Since fast motions cannot be made in the same path as slow motions, the learner will acquire desirable automaticity quickest if he works at motions-speed of expert from the beginning, regardless of the quality of the resulting work.
14. Lateness of anatomical members of the expert should be observed most carefully. Where it is not possible to work from the first at the speed of the expert, this lateness should be copied as closely as possible.
15. Rhythm is most important and is largely a matter of time, and not of distance, although making a motion covering the same distance many times consecutively will affect rhythm to some extent.

[1] A convenient manner of graphing these results is suggested by Martin Wiberg in *Advertising Management*, 6: 108–109, 1941.

[2] GILBRETH, L. M., Motion Study, in *Handbook of Business Administration*, ed. by W. J. Donald, p. 640, McGraw-Hill Book Company, Inc., New York, 1931.

16. **Awkwardness, grace, ambidexterity, and bimanualability are all greatly affected by the time element, which affects also hesitation and decision and many other psychological variables.**

The imposing array of process charts, simo-charts, cyclegraphs, and chronocyclegraphs is formidable to the novice whose cooperation must be gained in making a study of his motions. In actual operation, however, it impresses the same novice as "much ado about nothing." An illustration of this method of analyzing a simple operation will indicate both its simplicity and its value. B. Eugenia Lies, Director of Planning for R. H. Macy & Company, made an analysis and drew up a process chart of the motions customarily made in posting errors on a record card,[1] and listed the movements, therbligs, cycles, etc., as follows:

The operator

a. Looks at error slip for employee's number.
b. Searches for drawer containing record card of that number.
c. Left hand reaches for drawer.
d. Right hand dip pens in ink.
e. Left hand opens file drawer.
f. Right hand moves inkwell to drawer.
g. Left hand holds drawer while eyes search for card with proper number.
h. Left hand folds over card to position preparatory to writing.
i. Right hand moves pen to card.
j. Left hand holds card to aid posting by right hand.
k. Right hand positions pen for posting.
l. Right hand posts information on card.
m. Operator inspects card for number of errors posted during the month.
n. If there are no more than standard errors, operator fills in form #1183 (form containing the notice of errors).
o. Right hand reaches out for blotter.
p. Right hand grasps blotter.
q. Right hand moves blotter to record card.
r. Right hand blots card.
s. Right hand moves blotter to table.
t. Right hand places blotter on table.
u. Left hand turns over slip from which information has been posted.

The 21 steps listed in this operation were the results of "an analysis of present methods." The next task was the selection of the best elements and the determination, if possible, of simpler and better methods. It was observed that colored pencil would be just as satisfactory as pen and ink, and in consequence steps *d, f, o, p, q, r, s,* and *t* were eliminated. Step *j* was changed so that the right hand posted and placed the cards

[1] Lies, B. E., The Technique of Determining the "One Best Way" in *Handbook of Business Administration*, edited by W. J. Donald, pp. 888–895, McGraw-Hill Book Company, Inc., New York. For a thorough and recent study, see Mildred Fairchild, Skill and Specialization, *Personnel Jour.*, 9: 28–70, 128–175, 1930–1931.

back, thus leaving the left hand free to turn the slips from which the errors were being posted. A motion picture of the operation also showed

a. The operator's left hand was idle a large part of the time.

b. The arrangement of the work was bad, in that the premium slips from which the data were being posted were kept on top of a file which was at too great a distance from the file drawer.

c. The equipment was poor; for example, the operator was obliged to stand and bend over the tray.

As a result of these observations, the following changes were introduced:

a. The work to be done was put on a tray at the side of the drawer; in that position the distance between the unfinished slips and the cards on which the posting was to be made was decreased.

b. The operator was seated, thus reducing strain and fatigue.

c. The right hand found the cards, held them back, and posted them, while the left hand turned over each premium slip as it was posted.

"The synthesis of these fewer elements in the more comfortable position resulted in the establishment of a standard, quicker, and less fatiguing method of performing the operation."[1]

Mrs. Gilbreth suggests that similar studies, in more detail when necessary, may be made of any operation by the use of micromotion studies and the resulting chronocyclegraphs; but in these studies one should always bear in mind the fact that the major elements in the work situation are

a. The work place so arranged that the work surface permits the operator to work at ease without bending over or straining upward, and with the circular work space so defined that the work can be done within the least fatiguing area.

b. The work material and tools so arranged that the human element can be conserved, can operate most efficiently without undue fatigue, and can express itself naturally.

c. The skills that should be acquired, the easiest and most natural form they should take when acquired, and the facility with which they can be developed.

Value of Time and Motion Studies.—The fixing of piece rates, the placing of responsibility on the shoulders of the worker, and the increase in production are the net results of these studies and the obvious justifications of their use. Repeated reports of surveys by the bulletins of the Taylor Society and the Society of Industrial Engineers[2] show their possibilities and value, and isolated studies by numbers of other workers,

[1] LIES, *op. cit.*, p. 891.

[2] *Bulletins* of the Society of Industrial Engineers, 6: 268–276, 1925; 12: 154–169, 331–343, 415–420, 490–504, 540–554, 1927; and 13: 126–136, 478–480, 519–525, 1927.

especially Farmer and Mogenson, have proved their value in different organizations. Farmer cites the following cases:[1]

a. A group of girls folding cloths according to a pattern were making from 20 to 30 motions for each piece. Study of their movements reduced them to 10 per piece and increased average individual production from 150 dozen to 400 dozen per day.

b. Studies of the methods used and the replacement of these by new methods resulting from motion studies brought about the following increases in efficiency: chocolate packing, 38 per cent; bottling sweets, 50 per cent; dipping chocolates, 88 per cent; putting paper in boxes of shoe polish, 100 per cent; polishing metals, 200 per cent; and using the emery wheel in filing spoons, 200 per cent.

If the studies of time and motion are used as a basis for establishing rhythmical patterns of movements, all of which are so interrelated that one easily and naturally leads to the next, without the necessity of constant selection and discrimination on the part of the operator—whose attention can then be centered on the end result of the operation—the selection of the most satisfactory movements for each operation is a valuable tool for industry.

The introduction of process charts has proved their value in both the factory and the office. As Mogenson says,

Process charts pay; they develop a questioning attitude that considers the good of the plant rather than that of a department or an individual. They indicate the best type of operator and equipment needed, determine where the work can be most economically performed, even out the flow of work, eliminate unnecessary movements, and point to further improvements. As a training tool, and a rapid one, they are unequaled.[2]

An illustration of the beneficial effects of the development and use of process charts is seen in a study reported by W. A. Bass, Director of Budgets for the Westinghouse Electric and Manufacturing Company.[3] A complete study was made of the typing department, involving the routine of the department as a whole, as well as the operating tasks of each worker. As a result of the study, the following changes were recommended and introduced:

a. The typewriters should be fastened to the desk, thus avoiding frequent position adjustments.

b. Typing from direct dictation should be discouraged.

c. Operators should be relieved of the collection and distribution of work.

d. Supervisors should be responsible for keeping the stationery racks of operators properly stacked, and should also code all telegrams.

e. The dictaphone should be more widely used.

[1] FARMER, E., *Industrial Fatigue Research Board Report*, No. 15.

[2] MOGENSON, A. H., How Are You Going to Train Your New Operators? *Factory Management and Maintenance*, 91: 353, 1933.

[3] BASS, W. A., Director of Budgets, Westinghouse Electric and Manufacturing Company, in *N.A.C.A. Bulletin*, 14: 1123, 1932–1933.

f. Extra machines should be available while others are being repaired.

g. The specialized work should be concentrated among designated operators, so that, for instance, those doing copy work are distinct from those doing dictaphone work, stencil cutting, shorthand, etc.

Objections to Time and Motion Study.—The objections to time and motion study are many: labor objects to being spied on, the public object to anything that approximates the "stretch-out" system, and the philosophical-minded socialist objects to the introduction of any tool that will mechanize human behavior. Some of the more important objections against the technique are given here:

1. It assumes that skill is composed of basic elements, of motions, each one of which is known through analysis, and that when these are known they can be synthesized into a simple and yet natural pattern of activity. This atomistic conception of a behavioral pattern assumes that the various times of different movements by different workers can be combined into one series of quick movements, each part of which is performed in the shortest time used by any worker. Everyday observations disprove this possibility; the variations in speed of response in different parts of the body, the difference in speed of adjustment between gross and fine muscular patterns, and the differences in degrees of skill in the same person in different types of sports, show that the rate at which one muscular pattern functions in one person is no indication of its possible speed in another.

2. This technique rests upon the debatable hypothesis that analysis and complete comprehension of a situation are identical. In many situations, if not in all, it is doubtful whether analysis can give us complete information about the whole picture. Any task may be analyzed into its elementary functions, while the nature of the task still remains unknown. Any whole is more than an additive total of its different parts. The meaning and specific character of a situation are derived from the total pattern rather than from its isolated elements. The operation, reduced to a series of movements, is no longer an operation for the worker; it is a set of automatically performed habits the exercising of which gives opportunity for neither ingenuity nor satisfaction. As C. S. Myers says,

> The best mode of carrying out an industrial operation is not derived from a combination of more elementary movements selected from different individuals. Style is all important. An organism is organized; an individual is indivisible, and it is that very interrelation and integration which distinguishes the organism and the individual, let us not say from a machine, but from a mere aggregate of parts.[1]

[1] MYERS, C. S., *Industrial Psychology*, p. 82, The People's Institute Publishing Company, New York, 1925.

3. The technique of time and motion study assumes that the fewer the number of bodily movements and the more geometrically perfect they are, the less the amount of energy that will be expended; and the smaller the area of the body that is at work, the less the amount of fatigue that will be experienced. "The most economical motions are those made by the fingers; then the finger and wrist motions; then the finger, wrist, and lower arm motions; then the finger, wrist, lower arm, and upper arm motions; and finally, the finger, wrist, lower arm, upper arm, and bodily motions."

A simple experiment will show the invalidity of this hypothesis. Move any finger back and forth until it is fatigued, and compare the result with the number of rotations made by the arm before it fatigues. Then compare that with the total number of bodily movements made, before fatigue sets in, under the spell of the jazz orchestra. It is apparent that gross bodily movements are more easily made and produce fatigue less quickly than do isolated muscular adjustments, where only a small pattern of muscles is involved.

4. In spite of the fact that the system introduces rest pauses and a comfortable working situation, the workers complain that they are subjected to a speed that ultimately is detrimental to their health, uses up their nervous energy at too great a pace, and causes a decline in their efficiency at an earlier age than if they worked under a different system. Dubreuil[1] quotes the following incident:

On visiting Pittsburgh, Fraser, the English engineer, struck by the fact that he encountered only young and vigorous workers, asked the American who was guiding him, "Where are your old workers?" At first the American did not answer him, but finally, after Fraser had repeated the question a number of times, said, "Have a cigar, and while we are smoking we will go and visit the cemetery."

The speediest movements and the shortest ones are not necessarily the most efficient and least fatiguing ones. The quickest rhythm of movements may be the most tiring, even for the best worker.

5. The standard time set by motion-study analysts is often taken under abnormal conditions and circumstances that result in arousing either the antagonism or the scorn of the worker. Taylor set his standard high by selecting the best workers and offering them increased pay for working at maximum efficiency. The modern time-study man usually has no access to such an incentive, and the result is that the worker, while being studied, slackens his pace so that too great a task will not be required of him at some later time. When the analyst adds to the observed time a certain percentage, as Taylor suggested, for rests, unavoidable delays, and degrees of expertness, he is only making a guess,

[1] DUBREUIL, H., *Robots or Men*, p. 65, Harper & Brothers, New York, 1930.

for there is no available accurate information upon which he can base his calculation.

6. This method also ignores an important aspect of the job situation, *viz.*, the social setting in which it is placed. An operation is not an isolated event in the life of the worker; coworkers play a part in individual production rate; competition, recognition, and appreciation are constantly interplaying factors, which help to regulate the operator's behavior and determine his efficiency. Analyses that ignore these and pay attention only to the physically disturbing elements fail to diagnose the most significant motivating forces in the whole situation. As Dubreuil says,[1] "Taylor's genius stopped on the threshold of a new world, of whose importance he was apparently unaware, *viz.*, that of the inner forces contained in the worker's soul, and operating through the infinite powers of internal impulses which can be directed from without only by setting them free."

Job Analysis by Job Description.—The job-description, or position-description method, as it is sometimes called, usually covers the following items:

Title, department, etc.
Educational requirements.
Necessary experience, general and specific.
General brief description of the job.
Types of duties, usual and occasional.
Rating of job.

The necessary information is usually gathered by issuing questionnaires to the workers in the various positions, and to the foremen and superintendents under whose jurisdiction the positions fall. An illustration of this method is the questionnaire used by the General Electric Company.[2] Each employee was asked to complete a job description by defining his duties and giving the percentage of time spent on each. After listing his experiences and the length of time in each, he was asked for

a. A list of his duties with the hours per week spent on each.

b. The amount of supervision exercised, and the names and nature of the jobs under his direction.

c. The kind of equipment used and the hours per week spent on each, including also all forms of office equipment.

d. The contacts made with others within the department, with other departments, or outside the company, and the methods by which these contacts were made.

[1] *Ibid.*, p. 194.

[2] Reported in a dittoed collection of sheets used as a preparation for the mimeographed manual *Job Evaluation*, May, 1936.

Variations of the job-description method have been adopted by a number of companies. One that has been used in numerous cases is as follows:[1]

1. Secure a statement of the duties of the job. Because each worker's statement of duties differs in some minor details from every other, preliminary observation will show some jobs with the same or closely similar duties and degrees of responsibility, and the same or nearly the same qualifications. These are grouped together, and result in a number of classes of jobs.

2. Each class is identified by a job title and is described in a form, called job specification, which includes a definition of the duties, responsibilities, qualifications, promotional lines, and pay ranges of each job. When such definitions are made, existing departmental lines are ignored; the major duties and responsibilities of the job determine the class to which it belongs.

3. Broad occupational lines help determine the grouping of positions; in each major group jobs are compared with one another in terms of a number of factors. These factors are usually in five groups: responsibility; knowledge, skill and experience; work complexities; contacts; and working conditions.

4. Each factor is given a number of subdivisions according to the types of responsibilities, training needs, etc., that the job specifications have disclosed. The factors that are adopted and the subdivisions of each factor evolve from the job descriptions; they are not predetermined.

5. Each subfactor is divided into a number of degrees, or steps, which are used to measure the extent to which the factor applies to the particular job; the steps are assigned values, which are graduated on a geometrical progression, whole-number ratio. For example, Contacts with Other Departments (a subdivision of Contacts) may range from negligible (0), through incidental or occasional (1), usual day-to-day (2), systematic adjustments (4), follow-up (7), supervisory (10), to major decisions (15). The weight assigned to each factor in any job class is determined by the closeness with which the job contacts approximate one of these step descriptions, and is assigned its value—or a value above or below that—according to its degree of correspondence.

6. The total value of the factors provides a basis for converting points into wage equivalents; these do not follow any predetermined point-for-cent ratio, but are governed by varying ratios according to current rates for comparable jobs with the same duties and responsibilities.

The method described above does not claim to be exact or infallible; the values that are reached are based on the judgment, patience, and

[1] FARWELL, S. P., *Taking the Guesswork out of Wage Scales*, Business Research Corporation, Chicago, 1939, 15 pp.

thoroughness of those who look at the job from the point of view of participant, overseer, and spectator; inasmuch as human judgments err, some errors are unavoidable. The merit of the system lies in the fact that it does not carry any predetermined scheme or collection of factors which are superimposed on a number of jobs; instead it permits the job specifications to determine both the factors and the relative importance of each factor in the total point value.

The Individual Psychographic Method of Job Analysis.—To overcome the weaknesses of the other methods, particularly those due to an ignoring of the qualities and abilities demanded by the job situation, Viteles has devised this method.[1] It makes use of the customary job-analysis technique in seeking a description of the duties the job demands, a parallel of the process chart of the Gilbreths, but supplements that with a detailed account of the nature and conditions of the work, the time required to learn the task, the nature of the necessary training, the related jobs, the promotional possibilities, the advantages and disadvantages, and the general physical, educational, temperamental, experiential, and skill qualifications necessary for performing the job. Thus the method combines the features of occupational description with the more desirable parts of job-description technique.

In order to standardize the abilities required in different jobs, Viteles lists and defines 32 abilities, and requires that each one be rated on a five-point scale:

Point 1, meaning that the importance of the ability so rated is practically negligible in job success;

Point 2, meaning that the ability is called for to so slight an extent on the job that a deficiency in it on the part of the worker interferes only slightly with the capacity of the worker to perform efficiently the duties of that job;

Point 3, meaning that the ability is significant, but that it is not one that particularly distinguishes the job from other similar jobs;

Point 4, meaning that the ability is essential and that it is called for to a degree so great that a deficiency in it on the part of the worker engaged on the job would interfere seriously with the efficiency of the work;

Point 5, meaning that the job requires the ability to such an extent that a deficiency in it on the part of the worker would make him absolutely incompetent to fill the job.[2]

To ensure accuracy in the meaning of the 32 terms, Viteles gives rather lengthy definitions of each one, *e.g.*, Ability, 2, rate of discharge, is defined thus:

[1] VITELES, MORRIS, Job Specifications and Diagnostic Tests of Job Competency, Designed for the Auditing Division of a Street Railway Company, *Psychol. Clinic*, 14: 83–105, 1922; and Job Analysis in Vocational Guidance, *ibid.*, 15: 157–182, 1932. See also his *Industrial Psychology*, pp. 150–153, W. W. Norton & Company, Inc., New York, 1932; and OTIS, J. L., and K. R. SMITH, The Job Psychographs in Job Analysis, *Occupations*, 12 (No. 10): 1–54, 1934.

[2] VITELES, *op. cit.*, *Psychol. Clinic*, 14: 98–99.

By this is meant the speed with which energy must be expended on the job. In some jobs, such as that of longshoreman, much energy will be expended, but it is discharged slowly; while in others energy must be expended with great speed, as in emergency work on overhead lines. On the other hand, there are jobs in which the energy demand is low, and energy may be expended at either high or low speed.

To get an estimate of the job, Viteles recommends the use of trained interviewers. This is essential. The person gathering the facts must be trained in the technique and qualified by intelligence and tact to get the desired information from the employee. He must know enough about the job to be able to set aside the unimportant and unessential, and retain what is pertinent to the situation.

He must possess confidence in himself and in the importance of his mission, and he must have that kind of personality and exercise that degree of diplomacy and tact which will enable him to enlist the worker's interest in the enterprise . . . and awaken in him a desire to furnish a true picture of his work.[1]

The trained interviewer, equipped with his job specification sheet, his 32 definitions, and his five-point rating scale, confers with representative workers, secures the judgments of foremen and supervisors and of any other officers who are familiar with the job, and then completes

TABLE 81.—JOB PSYCHOGRAPH OF A POWER-MACHINE OPERATOR

QUALIFICATIONS

General	Physical	Competency	
Sex: Female preferred	Height: ?	Coordination A	4
Age limits: 18–50	Weight: ?	Coordination B	5
Preferred age: 18–40	*Use of both hands:*	Visual discrimination	4
Race and nationality: no limitations	Vision: normal or corrected	Space perception	4

Educational

Schooling		*English*		*Mathematics*	
Fifth Grade	X	Correspondence	____	Addition	X
8th Grade	____	Grammar	____	Subtraction	X
High school	____	Spelling	____	Multiplication	____
Technical	____	Inquiries	____	Division	____
Business	____	Telephone	____	Percentage	____
Correspondence	____	Speaking	____	Dollars and cents	____
General intelligence: Minimum M. A., 8 years				Decimals	____
				Fractions	____

Temperament. Must be cooperative in working as member of group when teamwork is employed. Adaptability to repetitive work.

Experience. No experience is required where firm trains. Trade school training, dressmaking experience are helpful. At present most firms demand experienced operators.

[1] SCOTT, W. D., R. C. CLOTHIER, and S. B. MATHEWSON, *Personnel Management*, 2d ed., p. 120, McGraw-Hill Book Company, Inc., New York, 1931.

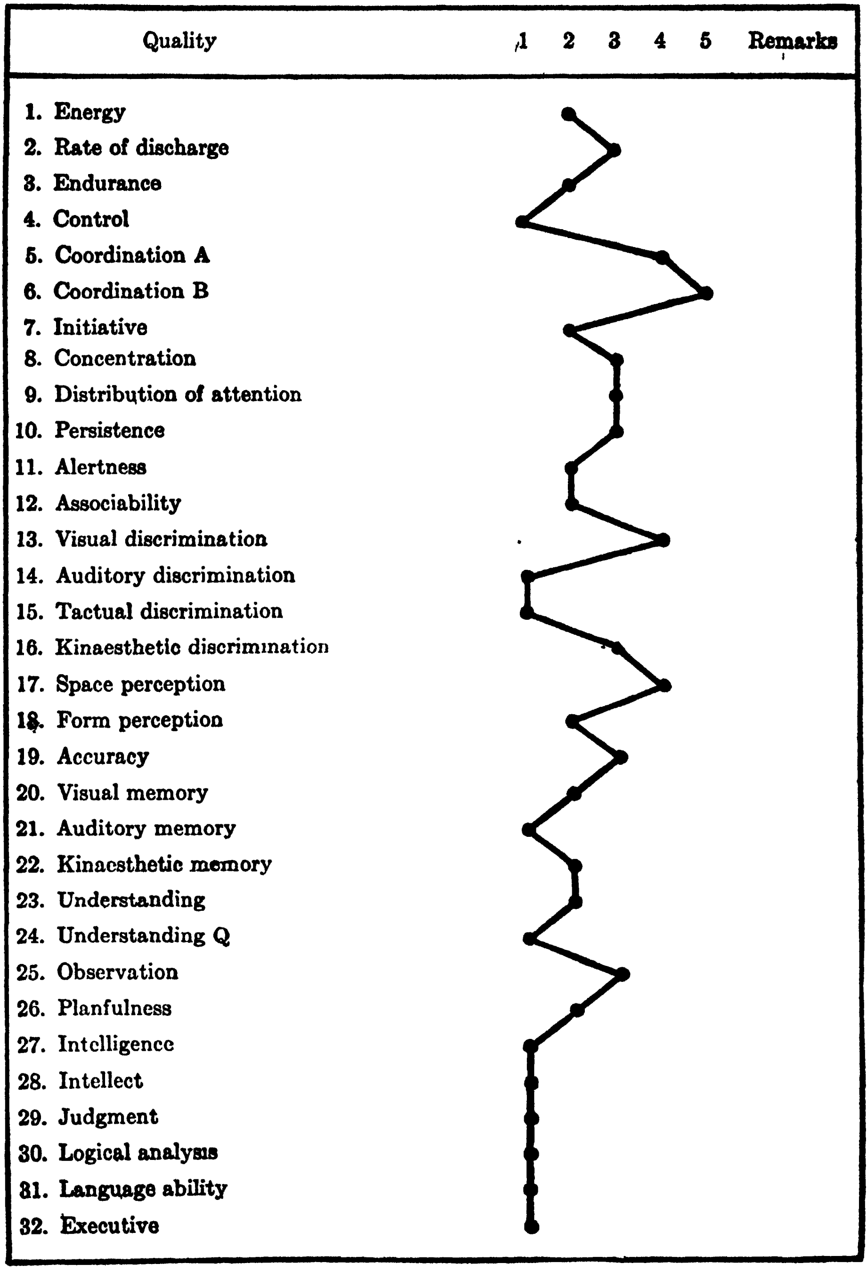


FIG. 19.—Job psychograph. (*After Viteles.*)

his job specification sheet and job psychograph. An illustration of an analysis of the position of power-machine operator[1] is given in Table 81; and the psychograph for the same position is given in Fig. 19.

Having finished the analysis, the interviewer faces his next and more difficult task, *viz.*, the selection or devising of tests that involve the same abilities as those required by the job. For his purposes Viteles makes use of some standard tests and some he has devised that are peculiar to the demands of the particular situation.[2] When these tests are well standardized and shown to be discriminative for the particular types of work, a tool is provided by which subsequent applicants for the position may be selected.

There is no doubt about the thoroughness, comprehensiveness, and probable adequacy of the technique. In an adapted form it is being used by the U. S. Employment Service, by an industrial engineer in a number of British industries, and by a large number of students in American industries; the psychograph that results from the analysis of the functions required on the job gives a graphical picture of the job demands, and in substance overcomes the weaknesses to which atomistic analysis is heir. The difficulties in carrying out such a profile study are many. This fact explains why a comparatively small number of industries have adopted it.

Foremost among such difficulties are these:

1. The lack of justification for such an exhaustive study. Unless there are many similar jobs in an organization, and labor turnover is moderately expensive, it is difficult to convince management that such a study pays. Viteles meets this objection with abundant proof that many ostensibly different jobs place the same demands on the worker and produce the same type of profile, so that if an exhaustive study were made of each job, transfer of workers to different departments would be simplified. Management's rebuttal is that by the time all the jobs were psychographed some of them would have changed so much in character that restudies would be necessary.

2. The difficulty of getting adequate job-and-men analysts. Obviously, the person making such an analysis must be familiar with psychological technique, must have had adequate statistical training, and must know something of shop practice. The staff of the average personnel department in even the most progressive organizations rarely has the time, the interest, or the ability to carry out such studies.

3. The most serious objection is the inability to find adequate tests to measure the 32 functions and the amount of time needed for adminis-

[1] Taken by permission of the publishers from Otis, J. L. and K. R. Smith, The Job Psychograph in Job Analysis, *Occupations, The Vocational Guidance Magazine*, 12 (No. 10): p. 53, 1934.

[2] See Viteles, *Industrial Psychology*, pp. 260–278.

istering them if and when they are discovered and given critical scores. Standardized tests of some of these functions in academic situations are available, but whether or not the same tests would be discriminative in the shop and office situations can be known only when experimentalists invade the shops with their kits of tests. For many of the functions no general tests are available; thus there is left to the analyst the task of devising, standardizing, and establishing critical scores for a great variety of tests—a task which even the most test-minded psychologist would hesitate about undertaking.

4. An apparent inadequacy of this rather exhaustive method is that it fails to study the job in its social setting. It is true that such conditions vary with every change in the personnel of the work situation, but it is also true that the social environment in which one works is among the most important determinants of the attitude the worker takes to his job and the satisfaction he derives from it.

THE USES OF JOB ANALYSES

The chief uses to which job analyses can be put were formulated by Meine[1] in 1919, and were divided into two groups: (1) for the improvement of working methods and processes; and (2) for employment purposes in selecting, transferring, and promoting employees, and in establishing wage schedules.

Since that time, job analysis has extended its scope and usefulness somewhat, and is now more commonly designated as job study, in which there are three phases:

a. An analysis of the component elements of a position in order to formulate its functions, operations, and environmental factors, together with an estimate of the physical and mental qualifications necessary to do the job effectively.

b. A resultant grouping of all the positions that are homogeneous in nature.

c. An arrangement of the groups in a hierarchy based upon an appraisal of their relative value within the organization or industry.

A complete list of the uses to which such a job study can be put is given by G. L. Bergen[2] as follows:

1. To improve the organization by developing relations among departmental, divisional, and sectional units so as to avoid overlapping of effort, duplication of authority, or improper flow of work due to poor space layout.
2. To improve the method of operation by disclosing faulty conditions of work, machinery, or procedures.
3. To improve the educational technique so that employees may have a clear picture of their daily and periodic duties and be in a position to give systematic training to their understudies.

[1] MEINE, J., Job Specification, *Federal Board for Vocational Guidance Bulletin* 45, 1919.

[2] BERGEN, G. L., Uses of Job Study, *Personnel*, 6 (No. 3): 85–100, 1929.

4. To acquaint the employees with the objectives of the personnel department, and foster a common understanding of the relationship between workers, supervisors, and management.

5. To help management know its employees better and make more adequate selection of those who merit training for promotion.

6. To disclose the cause of failure by comparing the production and accident record of individual employees.

Bergen also points out its value as a basis for improving methods of selection and placement, transfer and promotion, training and study, measurement of production, reporting and recording personnel activities, personnel grading, position classification, and compensation practice. In fact, there is no phase of industrial activity that well-made job studies do not serve.

HOW PROMOTIONS ARE MADE

The tools that are described in the above sections, together with the methods of appraisal of employees that are outlined in Chap. VIII, are the instruments used in making promotions. Promotion has two forms —salary and rank. Within each rank there is a salary range, extending from about the average of the rank below to the average of the rank above, and in some cases overlapping the adjoining ranks as little as 10 per cent or as much as 80 per cent. Promotion must naturally be within the salary range of the present rank before advance to another rank is made.

For salary promotion within a rank, the usual practice, especially in large companies, is to make a salary-adjustment review each month for those employees whose anniversaries occur that month; that is the normal expectation of the average employee. For exceptional employees, whether good or bad, with unusual promise or considerable dissatisfaction, the review may be made at the end of 2, 3, or 6 months, instead of annually.

The General Electric Company has adopted this policy with its exceptional employees, particularly the college graduates. If the employee is below average in production and adjustment, the review gives the employment department an opportunity to discuss with him danger points and necessary improvements. Any person who is confidentially told what progress he is making, why his pay and position remain as they are, what mistakes he has made and how he can avoid them in the future, what his shortcomings are, and how he compares with his promise when he was hired and with his associates on the job—any normal person, with that estimate of himself, ought to be able to form some opinion of the factors necessary for him to "get on." The exceptional person, on the other hand, may very profitably take advantage of the interview that the review of his promise has made possible, to get the recommenda-

tion of the personnel department for supplementary courses that he may take or personality weaknesses that others may have observed and that he should outgrow.

Another help in gaining promotion is by applying for some higher position in the organization than the one you now fill. When such an application is made, however, care should be taken to file it, not for the far-distant position you would like to fill, but for the position that you know you can fill, and that will better prepare you for your ultimate goal in the organization. At the time the application is filed, a list should be presented showing your previous experience in other fields of work, the qualifications which you think the new job demands and which in your estimate you possess, and the special preparation you have made for the new job.

The practice of filing applications for new positions is quite acceptable, widely used, and encouraged. Some companies have what they call a "better advantage notice," for which they encourage employees to file application. On the other hand, a reckless and indiscriminate filling in of notices of this kind may cost you your present position; the filing of such an application furnishes additional evidence to the personnel department of the sanity (or insanity) of your judgment and the keenness (or lack of it) of your powers of observation and discrimination. Applying for *anything* usually means and results in getting nothing and in probably losing what you have. Before such application is filed, it may be worth your while to compute the cost to the company of any errors you have made, and to compare your record with others in your department—especially the employees commonly regarded as the best workers—and to convince yourself that you are more worthy of being selected for the particular position you wish to fill than they are. Lawrence A. Downs, former president of the Illinois Central Railroad, said, "Being as good as the average is not quite enough to win regular promotion. It's necessary to be a little better, to work a little harder, perhaps display a little better grade of judgment, and express yourself a little more tactfully, persuasively, and fairly."[1]

Not all organizations, in fact very few, use complete records in keeping "tab" on their employees. In many concerns your promotion depends upon the recommendation of your immediate superior. If you are an above-average producer, he will not want to release you from his department, and often will attempt to keep you with him in order to maintain a good record for his division. Salary advance is moderately easy to secure, up to the limit the range permits, but rank advance is akin to an impossibility. General platitudes as cures for such situations are useless; each situation has its own peculiarities. One factor should always be

[1] Do Your Stuff—and Keep Your Eyes Open, *Amer. Mag.*, 104: 37, July, 1927.

remembered: The boss is more interested in himself then he is in you; he is just as sensitive to appreciation, and just as scornful of the chronic sucker or complainer as you are. Seek out his good points; he has them, or the company would not have given him a responsible position; do a little window dressing for him; if you get an opportunity to talk with his superiors, forget his weaknesses and extol his assets. A word of appreciation is much more effective if it reaches him indirectly than if given directly, when it may be interpreted as "flattery for a purpose."

Don't play the part of a reformer, but keep your eyes open for constructive possibilities. Then, when you have weighed a weakness from every angle, and find an opportune time, talk about it with your immediate superior. Let him take action on it and get the credit for it and for any number of your suggestions, if he cares to do so; they may or may not be worth anything; the chances are that the same suggestions have already been offered scores of times. In any case, don't look for immediate reward or recognition because of one idea you happened to "get across." Management, in time, will know the source of new ideas and will rectify any injustices which, in your judgment, a selfish foreman may "get off" on you.

Study the promotional methods of your organization. Usually, they do not depend upon one factor. Modern industry weighs the different contributory assets of each employee. One illustration will suffice. In Gimbel's department store the following steps are used to determine who is and who is not to be promoted:[1]

a. A grade is given as a result of tests that follow an instruction period in store arithmetic, spelling, legible writing, accuracy in making out slips of various sorts, and alertness in observation and comprehension.

b. For from two to four periods annually the employee is asked to wander around the store for a 2-hour period, and with the aid of a directory to fix store and material locations in his mind. At the end of each "roving" trip a test is given.

c. After a floor assignment has been given, the floor superintendent and the section manager check on the employee's appearance, alertness, grammar, ability to handle customers (*e.g.*, fluency in discovering customers' needs, patience with customers, willingness to persist until the customer's wants are discovered), and from the results another rating is made.

d. At department meetings, which are held frequently, the trainer reports and records employees' reactions; customers' letters are reviewed, and reports are given of appointed shoppers who have made purchases from the new employee and have observed her methods and manners.

e. Record is kept of errors, such as mistaken addresses and wrong charges.

f. A comparison is made of the selling costs of each salesman with departmental averages; if too much pressure is brought to bear on the customer, large numbers of sales are returned, and cost is high.

[1] MARSH, C. A., How Gimbels Study and Rate Their Employees, *System*, 3: 29–31, August, 1929.

g. At the end of 6 months, a curve is plotted showing the different factors and indicating the amount of improvement during the period.

Note the reasons why people in your organization lose their positions. One study of the causes of discharge and failure to grant promotion[1] in 76 corporations with an annual turnover of 5.8 per cent showed that failure was due to two factors—lack of specific ability and poor character traits. Of those discharged, 10.1 per cent lacked the necessary skills and 89.9 per cent lacked the necessary personality qualifications. Of those who failed to get promotion, 23.5 per cent were short on skills and 76.5 per cent were short on character essentials. Table 82 gives the results in more detail.

TABLE 82.—WHY PEOPLE LOSE THEIR JOBS OR ARE NOT PROMOTED

Deficiencies	Groups	
	Discharge (per cent)	No promotion (per cent)
Lack of specific skills in:		
Shorthand	2.2	3.2
Typewriting	1.6	2.4
English	1.6	5.2
Dictaphone	1.3	1.6
Arithmetic	1.3	3.0
Office machines (use of)	.9	2.2
Bookkeeping	.6	1.4
Spelling	.6	2.7
Penmanship	0	1.8
Character traits:		
Carelessness	14.1	7.9
Noncooperation	10.7	6.7
Laziness	10.3	6.4
Absence for other cause than illness	8.5	3.7
Dishonesty	8.1	1.2
Attention to outside things	7.9	5.6
Lack of initiative	7.6	10.9
Lack of ambition	7.2	9.7
Tardiness	6.7	4.6
Lack of loyalty	2.2	3.3
Insufficient care of and improper clothing	1.6	3.0
Self-satisfaction	.9	4.4
Irresponsibility	.3	.8
Unadaptability	.3	1.4
Absence due to illness	.0	2.4

[1] HUNT, H. C., Why People Lose Their Jobs or Aren't Promoted, *Personnel Jour.*, 14: 227, 1935–1936.

Make a study also of the factors necessary for success in your particular organization. They are not exactly the same as those required in a near-by firm; demands vary from situation to situation. A study of 10,000 men made under the auspices of the Carnegie Foundation[1] showed that technical training accounts for 15 per cent of one's success, and personal qualities are responsible for the remaining 85 per cent. The most important qualities necessary for success listed by the foundation are attitude, initiative, thoroughness, observation, concentration, creative imagination, decision, adaptability, leadership, organizing ability, expression, and knowledge. The development of these is much more important than the perfection of knowledge of a trade. To show how they may be developed is the task of a textbook in personality development.

Promotion, in an increasing number of concerns today, depends upon merit, competition, and proper evaluation. If you are to advance in a field that is gradually becoming a part of yourself, you must comply with the standards of the organization in which you work. Realizing these standards is the result of effort and sacrifice. "While one earns his salary during the day, one often earns his promotion at night."

Topics for Report

1. Construct a chart similar to Fig. 17 for the position in which you are most interested, placing at the bottom of the chart the type of work you can do now, and as you go up the scale the different types of work you will have to do. Also give an estimate of the amount of time to be spent on each.
2. Construct a rating scale for the position of teacher of a course in business and industrial psychology. Rate your teacher on your scale when it is completed if you care (and dare!) to do so.
3. Select a rating scale in use in any company with which you are familiar, and compare it with the type you think would work in that organization. Devise one that would be appropriate for one type of work in that organization, and give the principles on which you base your technique.

Required Readings

1. Hepner, H. W.: *Psychology in Modern Business*, pp. 229–262, Prentice-Hall, Inc., New York, 1930.
2. Symonds, P. M.: *Diagnosing Personality and Conduct*, pp. 41–173, D. Appleton-Century Company, Inc., New York, 1932.

Supplementary Readings

1. Garrett, H. E., and M. R. Schenck: *Psychological Tests, Methods, and Results*, pp. 102–162, Harper & Brothers, New York, 1933.
2. Donald, W. J. (ed.): *Handbook of Business Administration*, pp. 159–166, 1035–1044, 1200–1206, McGraw-Hill Book Company, Inc., New York, 1931.
3. Allport, G. W.: *Personality, A Psychological Interpretation*, pp. 284–342, 400–463, Henry Holt and Company, Inc., New York, 1937.

[1] Quoted by Dick Carlson in *How to Develop Personal Power*, pp. 60–62, Harper & Brothers, New York, 1937.

CHAPTER XII

EMPLOYEE ACCIDENTS

Accidents are of two kinds, those involving the impairment or destruction of raw material or machinery, and those involving the destruction or impairment of human material; both kinds are due to one or both types of causes—personal and impersonal; both are causally interrelated, and to some extent are affected by the same preventive measures. Both are among the ever-present ills of industry for the prevention of which remedies are constantly being sought and laws formulated.

The extent and cost of accidents to machinery and material vary so much in different organizations that any estimate, even of the percentage cost in one industry, would be valueless; the waste of materials by breakage, by rejection because of inferior quality, by undue depreciation, and by the use of imperfect and inadequate machines must be added to the destruction of machinery because of improper use, too rapid depreciation because of inadequate care, and decay through disuse. Any estimate of the total cost, as indicated in "allowance because of depreciation," is only a rough guess. Its importance to management is indicated by the reduction-in-waste campaigns that are intermittently conducted and the specific directions for operating and caring for a piece of machinery that form a necessary part of employee training.

FREQUENCY, COST, AND NATURE OF ACCIDENTS

The extent and partial cost of accidents to human material can be more accurately given. Because of state laws and obligatory preventive measures, most establishments keep a record of all reported accidents.

Frequency and Severity of Accidents.—Table 83 gives the frequency and severity rate of accidents in 15 types of industries for 4 years—1936, 1937, 1938, and 1939.[1] The frequency rate is the average number of disabling injuries for each million man-hours worked; the severity rate is the average number of days lost for each thousand man-hours worked.

Some interesting trends are apparent if a comparison is made of the rates of these 4 successive years, and still more impressive are these trends

[1] Compiled by the Bureau of Labor Statistics and reported in the *Monthly Labor Rev.*, 46, 1939; 47, 1940; and 48, 1941.

TABLE 83.—FREQUENCY AND SEVERITY ACCIDENT RATES FOR 15 INDUSTRIES

Industry	Frequency rate				Severity rate			
	1936	1937	1938	1939	1936	1937	1938	1939
All industries	17.06	17.19	15.07	15.42	2.75	2.76	1.62	1.64
Chemical products	12.75	13.70	10.24	10.03	2.52	2.58	1.80	1.83
Food products	21.18	21.49	19.16	18.92	2.35	2.56	1.82	1.39
Iron and steel products	18.50	18.60	16.78	17.59	2.31	2.55	2.05	2.13
Leather and leather products	11.05	11.10	8.71	9.24	0.85	0.90	0.49	0.60
Lumber and lumber products	53.23	52.62	45.88	46.70	8.31	7.56	5.48	6.01
Machinery	19.13	20.11	11.02	11.07	2.22	2.46	1.32	1.12
Paper and allied products	23.12	24.49	20.10	20.50	2.70	3.01	1.97	1.95
Printing and publishing products	6.94	7.34	6.48	6.95	0.86	1.03	0.54	0.72
Rubber and rubber products	12.14	12.24	9.95	9.75	1.21	1.47	0.69	0.79
Stone, clay, and glass products	22.62	21.20	18.90	21.20	2.31	2.30	1.97	2.24
Textile and textile mill products	9.17	9.45	8.46	9.00	0.92	0.99	0.60	0.58
Transportation equipment	10.33	9.71	13.08	13.86	1.47	1.24	1.51	1.54
Miscellaneous manufacturing	10.54	9.73	10.14	10.40	1.59	1.35	1.25	1.36
Public utilities	9.87	12.16	8.53	8.24	1.68	2.00	1.35	1.11
Laundry and dry cleaning	10.58	8.66	5.74	6.97	1.76	1.26	0.41	0.58

if a comparison is made over a 6-year period. Some of the obvious trends are these:

a. The large variations in both frequency and severity in different industries; the highest, the lumber industry, has a frequency rate as high as 53.23 and a severity rate of 8.31, while the lowest, the printing and publishing industry, has a frequency rate as low as 6.48 and a severity rate of 0.54.

b. A steady decrease in both frequency and severity is apparent throughout most of the 4-year period; for the 6-year period, 1934 to 1939, there is a frequency decrease of 30 per cent and a severity decrease of 50 per cent, the frequency decreasing from 22.24 in 1934 to 15.43 in 1939, and the severity decreasing from 3.28 to 1.64.

c. A considerable variation in the rate decrease in different industries; some—*e.g.*, machinery—reduced the frequency rate 50 per cent during the 4-year period, while others—*e.g.*, printing and publishing—seem to have reached an irreducible minimum.

d. A reversal of the general trend is apparent in one industry only, transportation; during the 4-year period it shows a frequency rate increase of approximately 30 per cent, but it retains a fairly constant severity rate.

The frequency with which accidents occur in one organization is indicated in the graph in Fig. 20;[1] this graph gives the frequency and severity rate and the number of compensation cases in one division of the Westinghouse Electric and Manufacturing Company for the years 1934 to 1940.

[1] The data were supplied, and permission was given to use them, by T. O. Armstrong, East Springfield Division, Westinghouse Electric and Manufacturing Company.

It will be noticed from the graph in Fig. 20 that the frequency rate decreased from an average of 8.6 during 1934 to an average of 2.1 during 1940, and that during the same period the severity rate was reduced from 1.1 to 0.275. It should be noted that during that 7-year period there was a concerted and well-planned safety campaign conducted continuously throughout the entire plant.

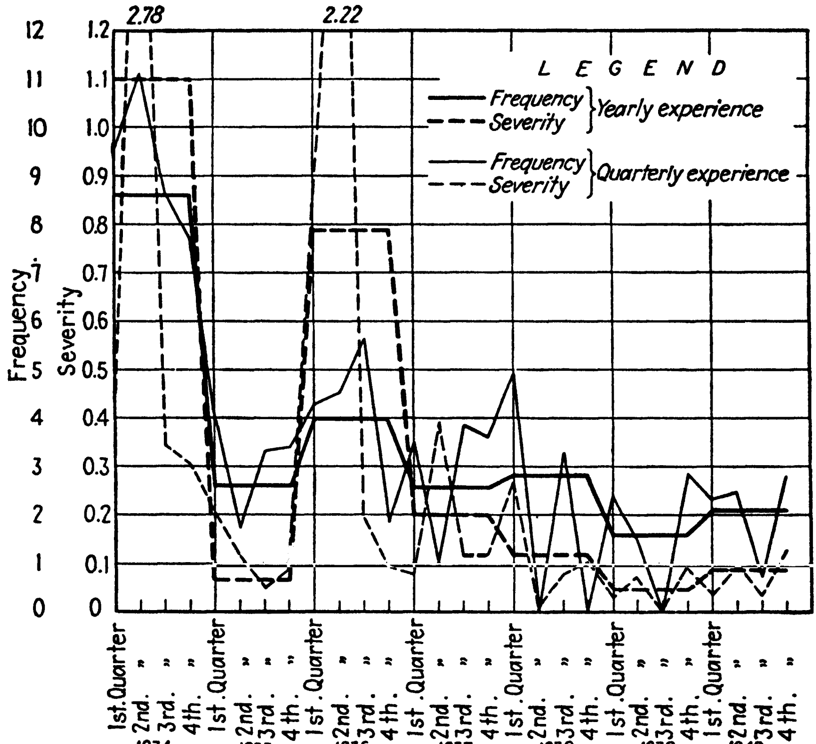


FIG. 20.—Accident prevention experience. (*Courtesy of Westinghouse Electric and Manufacturing Company, East Springfield Works.*)

The Cost of Accidents.—There is no way by which one can arrive at an approximate cost of accidents. How can anyone equate the value of 24,000 lives in terms of cash equivalents? And how tell the aftereffects on the individual of an impaired part of the body? The decreased rate of production is one of the minor costs; accompanying that is a decrease in the quality of work, a possible change in attitude toward the organization, a disturbed emotional state—particularly, the development of the emotion of fear—an increased susceptibility to accidents, and very often an impediment to activity in other-than-work relationships. Estimates

of immediate cost have been supplied by a number of organizations. The Armco Company gives the following estimates for one year.[1]

Total number of major accidents	228
Average compensation cost per major accident	$259.17
Average net wage loss per compensation case	73.91

Estimates for one year that are given by different authorities are reproduced in Table 84.

TABLE 84.—ESTIMATES OF ACCIDENT COSTS IN ONE YEAR

Authority	Estimated number of fatal accidents	Estimated number of non-fatal accidents	Estimated cost
National Safety Council	99,000	2,500,000*	
L. I. Dublin	24,000	3,000,000†	
Bruere and Pugh	17,000–23,000	2.5–3,000,000	1,000,000,000‡

* *Accident Facts*, p. 5, National Safety Council, 1931.
† DUBLIN, L. I., *Harper's Magazine*, January, 1930, pp. 239–298.
‡ BRUERE, H., and G. PUGH, *Profitable Personnel Practices*, p. 188, Harper & Brothers, New York, 1929.

The direct costs of accidents in the form of compensation, medical attention, hospital service, and clerical expense are but a small part (usually estimated at one-fourth) of the total cost. In addition, there are many incidental costs: the time lost by the foreman and others in coming to the assistance of the injured man, the time spent in investigating and reporting the accident, the temporary slowing down of activities in the department, the amount of time spent in training a substitute, the increased fear and caution on the part of the near-by workers, and the disturbed emotional state of friendly coworkers, all contribute to a slowing down of production rate and introduce elements the extent of whose influence it is impossible to estimate. Heinrich has classified these as indirect costs of accidents[2] and groups them as follows:

1. Cost of time lost by the injured employee.
2. Cost of time lost by other employees who stop work.
   a. Out of curiosity.
   b. Out of sympathy.
   c. To assist injured employee.
   d. For other reasons.

[1] ADAIR, R. C., Foreman Training That Works, *Factory and Industrial Management*, August, 1930, p. 338.

[2] Quoted by SCOTT, W. D., R. C. CLOTHIER, S. B. MATHEWSON, and W. R. SPRIEGEL, *Personnel Management*, 3d ed. pp. 375–376, McGraw-Hill Book Company, Inc., New York, 1941.

3. Cost of time lost by foremen, supervisors, or other executives as follows:
   a. Assisting injured employee.
   b. Investigating the cause of the accident.
   c. Arranging for the injured employee's production to be continued by some other employee.
   d. Selecting, training, or breaking in a new employee to replace the injured employee.
   e. Preparing state accident reports, or attending hearings before industrial commissioners.

4. Cost of time spent on the case by first-aid attendant and hospital staff, when this time is not compensated by insurance.

5. Cost due to injury to the machine, tools, or other property, or to the spoilage of material.

6. Cost due to interference with production, failure to fill orders on time, losses of bonuses, payments of forfeits, and other similar causes.

7. Cost under employee welfare and benefit systems.

8. Cost in continuing the wages of the injured employee in full after his return—even though the services of the employee (who is not yet fully recovered) may for the time be worth only about half his normal value.

9. Cost due to loss of profit on the injured employee's productivity, and on idle machines.

10. Cost of subsequent injuries that occur in consequence of the excitement or weakened morale caused by the original accident.

11. Overhead cost—the expense of light, heat, rent, and other such items—that continue while the injured employee is a nonproducer.

Types of Accidents.—A classification of accidents into groups is of value in attempting to understand the most frequent causes and the possible remedies. The most commonly accepted grouping is in the following three divisions:[1]

1. Those due to mechanical causes, such as unguarded machinery, defective equipment, dangerous elevators, obstructed pathways, etc.

2. Those due to physical and physiological causes, such as long hours, unhealthy working environment, inadequate lighting and ventilation, undue fatigue, nervous strain, and sickness.

3. Those due to psychological factors, such as inexperience, carelessness, recklessness, worry, emotional upsets, irresponsibility, and poor attitudes.

The specific form that the accident takes varies from industry to industry. In one plant the most frequent are cuts and bruises to the hands, while in another the most common are injuries to the eyes. Table 85 gives a summary of the reports of surveys by different industrial commissions in five states for 1933.[2] The survey includes over one million injuries in different industrial and business organizations, and in homes, and is based on reports sent to the state safety departments.

[1] SCOTT, CLOTHIER, MATHEWSON, and SPRIEGEL, *op. cit.* p. 385.

[2] Quoted in VERNON, H. M., *Accidents and Their Prevention*, p. 244, The Macmillan Company, New York, 1937.

It will be seen from Table 85 that cuts, lacerations, bruises, and contusions comprise nearly half (48.9 per cent) of the injuries, while strains and sprains make up 17.4 per cent, fractures 16.5, and burns and scalds 6.8 per cent.

TABLE 85.—TYPES OF ACCIDENTS

Situation causing the accidents	Percentage distribution of injuries					
	Cuts and lacerations	Bruises and contusions	Strains and sprains	Fractures	Burns and scalds	Other injuries
Handling goods	26.7	16.4	28.9	12.0	7.0	8.2
Mechanical injury	46.8	16.9	3.0	17.8	1.6	13.9
Persons falling	9.9	25.3	33.0	24.9	.9	6.0
Struck by falling body	22.3	40.8	4.8	26.9	.2	5.0
Use of hand tools	59.4	20.2	3.9	8.9	.4	7.2
Stepping on or striking objects	46.8	28.5	3.4	6.0	.2	15.1
Electricity, explosives, and heat	4.3	2.2	.2	2.0	84.5	7.0

Another study showing the variations in types of accidents in one plant in which there were 6,600 workers[1] shows that for 1 year there were 261 lost-time and 25,112 minor accidents, and that among these the same ratio held as is reported in Table 85. Among the lost-time accidents, loss of hand, fingers, or eye comprised 16 cases; fractures of different kinds, 57; cuts, 52; sprains and strains, 23; burns, 6; and infection, 29. Lacerations, contusions, sprains, and infections comprised most of the minor accidents. The frequency with which any one type of accident occurs is an indication of the nature of protective devices that may be necessary, the locations in the plant for which special instructions should be given, or the cautions necessary in making selections for the particular type of work.

CAUSES OF ACCIDENTS

Accidents are usually the result of a number of factors, all of which contribute to the final result; in many cases, the obvious cause has been only the immediate and easily observed factor, while the real cause has been in the form of remote experiences which project themselves into a situation not differing from that present throughout the entire working day. To classify causes is only to select the one or two factors in any situation that are of primary importance. Very rarely is any one factor responsible for an accident, but a variety of disturbing elements

[1] SLOCOMBE, C. S., How to Cut Accident Costs, *Personnel Jour.*, 16: 135, 1937.

may cluster around any one danger point and contribute to the end result. These danger points have been variously classified. Drabs[1] classified the causes of fatal accidents in French industries into (1) fortuitous causes, which could not be foreseen, (2) inadequate protection of the worker, and (3) psychophysiological maladjustment of the worker to his work. Köhler placed the causes of accidents among 5,000 workers in a metal industry in Germany into six groups:[2] (1) defective machinery, which was responsible for 15 per cent; (2) unexpected incidents, 10 per cent; (3) ignorance of the danger, 10 per cent; (4) physiological defects of the worker, 15 per cent; (5) low intelligence, 10 per cent; and (6) carelessness, 30 per cent.

The customary division of causes places them in two groups: (1) impersonal, with the primary cause in the environmental situation, and attributed to improperly protected machinery, poorly arranged material, improper lighting or poor ventilation, rate of production, noise, or some other environmental factor; (2) personal, with the primary cause to be found in the individual. The frequency with which these two sets of causes are responsible for accidents varies. Some estimate that impersonal factors are responsible for 10 per cent, and personal for the remaining 90 per cent. Köhler's grouping divides than on a 25 to 75 per cent basis. The majority of estimates have a range of from 10 to 25 per cent due to impersonal factors, with the remaining percentage due to factors within the individual worker. Any division of causes is arbitrary and very rarely explanatory. A glance at Table 83 will indicate that there is considerable consistency in the frequency rate in the same industry, and that the variations in different industries are much greater than those in any one industry. The indication seems to be that there are factors inherent in some industries —*e.g.*, lumber and lumber products—that are primarily responsible for the high frequency, and that the significance of these factors varies in different industries. Some of the factors can be remedied, while others depend upon personal elements, which may, or may not, lend themselves to correction. The most significant material factors that are responsible for accidents are considered here.

ENVIRONMENTAL CAUSES

I. Atmospheric Conditions.—The effect of atmospheric conditions upon workers' efficiency varies with the workers themselves; a condition that is comfortable for some is unbearable for others. Because of this

[1] DRABS, JOSÉ, and PAUL SOLLIER, *La Psychotechnique*, p. 143, Comité Central Industriel de Belgique, Brussels, 1936.

[2] KÖHLER, O., Industrielle Unfallverhutung auf Psychotechnischer Grundlage, *Industrielle Psychotechnik*, 9: 97–104, 1932.

TABLE 86.—COMFORT VOTES IN RELATION TO DRY-BULB TEMPERATURES

Dry-bulb temperatures in degrees F.	Number of observations	Per cent of people who felt: Comfortable	Comparatively cool to comfortably warm
54–55 9	39	28	67
56–57 9	100	46	76
58–59 9	161	58	80
60–61 9	478	77	88
62–63.9	667	84	91
64–65 9	549	78	92
66–67 9	527	69	87
68–69 9	382	60	88
70–71 9	151	45	83
72–75 9	31	45	61

variability, it is impossible to predict an individual's susceptibility to discomfort and, in consequence, his liability to accident.

In spite of the fact that body temperatures are fairly constant, 98.4°F. for the mouth and 99°F. for the deep tissues, the variations in susceptibility to discomfort are striking. The results from one survey will indicate these differences. Bedford made a number of observations, and secured workers' reports of their feeling experiences, in a number of factories. He reports the variations[1] indicated in Table 86.

For the majority of factory workers doing light work, a dry-bulb temperature of 64°F. represents the most satisfactory condition; variations of two or three degrees from that seem to have very little discomforting effect. For different types of working situations the American Ventilating Engineering Association recommends the following ranges as the most acceptable:[2]

Lecture halls	61–64°F.
Sleeping rooms	54–59
Bathrooms	68–72
Gymnasium	60
Workshop (moderate activity)	61–64
Workshop (vigorous activity)	50–59

But the temperature, as registered by the dry-bulb thermometer, may not be an indicator of comfortable atmospheric conditions. In spite of a

[1] BEDFORD, T, The Warmth Factor in Comfort at Work: A Physiological Study of Heat and Ventilation, *Industrial Health Research Board Report* 76, p. 23, 1936.

[2] Quoted in HOLLINGWORTH, H. L., and A. T. POFFENBERGER, *Applied Psychology*, p. 100, D. Appleton-Century Company, Inc., New York, 1917.

registered desirable level, the working situation may produce discomfort because of frequent drafts, excessive moisture, or undue dryness. The recording and regulating of these factors, and equating them with experiences of comfort and discomfort, have been the more common problems of the safety engineer during the past few years. The inadequacy of the dry-bulb thermometer as an indicator of comfort has long been recognized. The fact that it records the temperature in only one position in a room or shop renders it inadequate as a measure of other atmospheric conditions that make for comfort or discomfort; the moisture content of the atmosphere, the rate of air movement, and the effects of radiant heat are not even indicated by it.

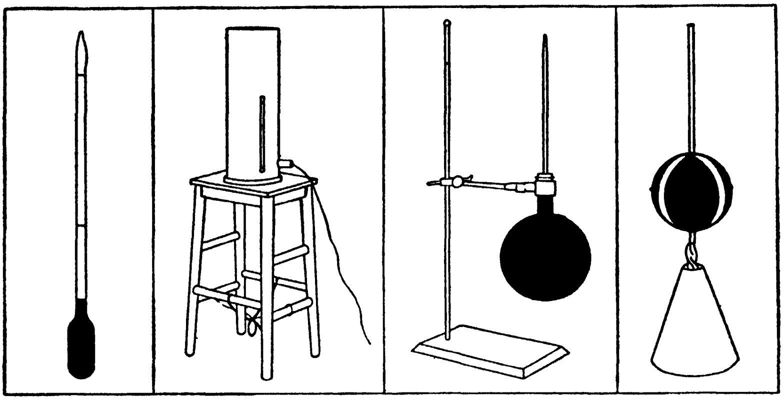
A. Recording and Regulating Devices.—To overcome these inadequacies, a number of devices have been suggested. Among them the following have been frequently tested:

1. *The Katathermometer* (see Fig. 21*A*).—This was devised by Leonard Hill in 1914. It is an alcohol thermometer, with a bulb 4 centimeters long and 2 centimeters in diameter, the stem of which is marked at 100°F. and at 90°F. When used, it is first heated to a temperature above 100°F. by immersion in hot water; then an observer records the time it takes in cooling from 100 to 95°F. The instrument thus measures its own rate of cooling, and that depends partly upon the temperature of the surrounding air and partly on the velocity of air currents that impinge upon its bulb. For each instrument there is a simple formula which combines the total amount of heat, in millicalories, lost per square centimeter and the number of seconds it takes to cool from 100 to 95°; the calculation from this formula gives a measure of the cooling power of the air. The rate at which the instrument cools is an index of the power of the atmosphere to cool the skin surface, a power that is measured in terms of the dry-bulb temperature, the radiation, and the rate of air movement.[1]

2. *The Eupatheoscope* (see Fig. 21*B*).—This is a heated, blackened cylinder, 22 inches high and 7½ inches in diameter. Two electric lamps are placed inside the instrument, and current is supplied through a mercury switch, which is controlled by a thermostat placed inside the cylinder. When the temperature of the thermostat reaches 78°F., the current is turned off; and when the temperature drops below 78°F., it is automatically turned on. The rate of heat loss from the surface of the eupatheoscope varies with the temperature and rate of movement of the surrounding air, and with the amount of radiation from the surroundings. The thermometer readings depend upon the amount of heat that is generated within the cylinder. The instrument readings are given on a scale of equivalent temperatures, and these furnish an index of the rate

[1] For a complete description see, *The Katathermometer in Studies of Body Heat and Efficiency*, H. M. Stationery Office, London, 1923.

at which black bodies would lose heat in that environment. Its registered temperatures approximate those of the human body; for example, in an enclosure registering 65°F. the surface temperature of the eupatheoscope



(*A*) The kata-thermometer. (*B*) The eupatheo-scope. (*C*) The globe thermometer. (*D*) The resultant thermometer.

FIG. 21.—Measures of atmospheric conditions. (*Courtesy of The National Institute of Industrial Psychology.*)

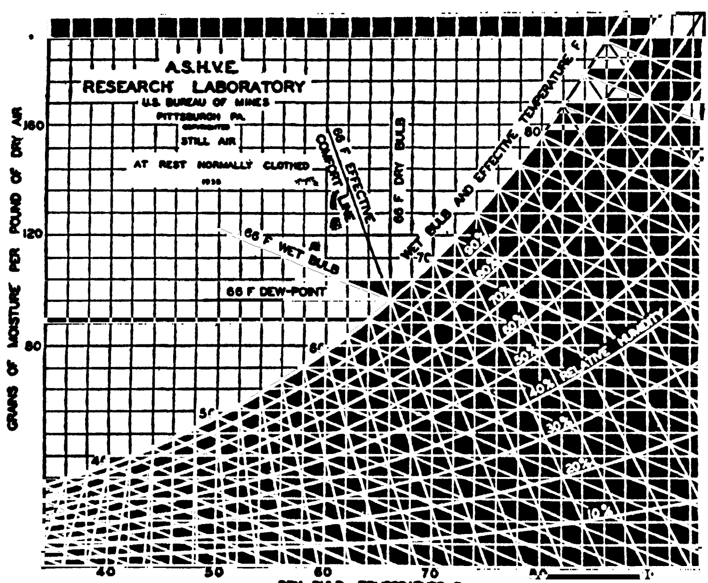


FIG. 22.—Psychrometric chart, persons at rest, normally clothed, in still air (15 to 30 fpm).

is 75°F., *i.e.*, the average surface temperature of the human body under such conditions.

3. *The Globe Thermometer* (see Fig. 21*C*).—This is a blackened, hollow copper sphere, 6 inches in diameter, containing an ordinary

thermometer with its bulb at the center of the sphere. Recorded temperatures lie between the temperature of the air and the mean temperature of the surroundings; the readings of the thermometer are affected by radiant heat, rate of air movement, and temperature.

4. *The Resultant Thermometer* (see Fig. 21*D*).—This is a small globe thermometer having a part of its surface covered with moist gauze. Its scale is regulated in a manner similar to that of the eupatheoscope, but its readings are determined by humidity as well as by radiation, temperature, and rate of air movement.

5. *Effective Temperature.*—This is the most widely used measure of the effects of atmospheric conditions. It is an index of a person's feeling of warmth as affected by dry-bulb temperature, moisture content, and movement of air. The charts in Figs. 22 and 23[1] indicate the comfort

TABLE 87.—INDEXES OF COMFORT

Scale	Comfort zones deg. F.	Factors measured			
		Temperature	Humidity	Air movement	Radiation
Katathermometer	70–75	X		X	X
Eupatheoscope	57–63	X		X	X
Globe thermometer	62–68	X		X	X
Effective temperature	57–63	X	X	X	
Resultant temperature[1]	58–66	X	X	X	X
Ordinary thermometer	Valuable only when there is very little air movement and no effect from radiation.				

[1] This is a recent development, and very little is known about its effectiveness.

zones under two rates of air movement, Fig. 22 for still air, or for air velocity between 15 and 30 feet per minute, and Fig. 23 for 300 feet per minute velocity. A comparison of the two charts will indicate that the comfort line varies in terms of each of the three variables, the 66° line indicating the optimum effective temperature for the average American living inside the broad geographic belt in which central heating of the convection type is used; a zone on either side of that optimum line, ranging from 63 to 71° for winter and 64 to 79° for summer, gives the comfort area for the average worker.

Table 87, on page 339, presenting the factors in the atmosphere that are measured by the different scales, gives some indication of the conditions under which their use is effective.

[1] Copyright, American Society of Heating and Ventilating Engineers, from *Heating Ventilating Air Conditioning Guide*, 1938.

The necessity for using one of the scales that are more effective than the scale of the ordinary dry-bulb thermometer is apparent in factory conditions, where variations in air movement, humidity, and radiant heat are often factors more effective in producing discomfort than are high or low temperatures.

The effect of atmospheric conditions on output and accident rate has been demonstrated in a number of studies. Obviously, the optimum temperature varies with the type of work that is performed and depends upon the state of health, the age, the clothing, the diet, and the ability of the employee to adapt himself to different climatic conditions. Some of the reported results from a change in atmospheric conditions as it

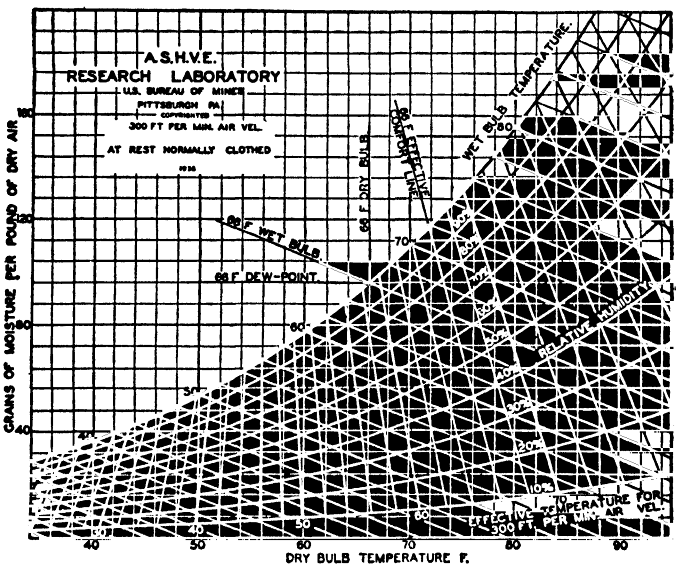


FIG. 23.—Psychrometric chart, persons normally clothed at rest, in 300 fpm air velocity.

affected rate of output are striking. The Eastman Kodak Company reported a 4 per cent increase in output and a 50 per cent decrease in illness under two contrasting conditions, one in a year in which there were poor atmospheric conditions due primarily to a poor ventilation system, and another in which a satisfactory ventilation system had been installed. A number of heating and ventilating engineers at Pittsburgh reported four times as much work done in one experimental station where the temperature was at 100°F. and the humidity at 30 per cent, as in another station in which both temperature and humidity were at 100; on the other hand, when the humidity was kept constant, at 60 per cent, and the temperature was at 90°F., five times as much

work was done as when the temperature was at 120°F. Yaglow[1] reports that under laboratory conditions, men do twice as much physical work at a dry-bulb temperature of 70°F. as at a temperature of 95°, and six times as much at 70° as at 110°. The Industrial Fatigue Research Board gives a graphic picture (see Fig. 24) of the relative output per month in a tin-plate factory, where the presence of furnaces unavoidably raises the general temperature. Figure 24 shows a close agreement between the external atmosphere and the average output.

B. The Effects of Atmospheric Conditions on Accidents.—Numerous studies have been reported showing a close relation between accident frequency and atmospheric conditions. A study in munition factories[2] reported accidents at a minimum when temperature was at 67.5°F.,

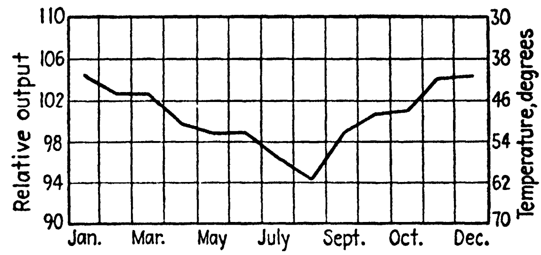


FIG. 24.—Relative output at different months of the year. (*Industrial Fatigue Research Board Report* 1.)

and rather low when the temperatures ranged between 62.5 and 72.5°; when, however, the temperature fell to 52° the accident frequency rate increased 35 per cent, and when the temperature rose above 72° there was a rapid increase in accident rate; at 77.5° there was a 50 per cent increase over that at 72.5°. In another study, Vernon reports an accident rate of 78 per 100,000 man shifts when the temperature was at 70°, against 137 when it was at 80°. Welch[3] reports a 55 per cent increase in accidents in a colliery with poor ventilation in the airways, over that in another colliery in the same mine where the airway ventilation was satisfactory.

Probably the most thorough studies of the relation between accident frequency and severity and temperature range have been made under the auspices of the Industrial Health Research Board. The results from two of these studies are summarized in Table 88. The reports are based on one study of 18,455 underground men and 4,456 surface men working

[1] YAGLOW, C. P., Effects of High Temperatures, *Industrial Psychol.*, 2: 601–603, 1927.

[2] VERNON, H. M., The Influence of Hours of Work and of Ventilation on Output in Tinplate Manufacture, *Industrial Fatigue Research Board, Report* 1, p. 21, London, England, 1919.

[3] WELCH, H. J., and G. H. MILES, *Industrial Psychology in Practice*, p. 142, Sir Isaac Pitman & Sons, Ltd., London, 1932.

in 10 collieries in 1924–1925, and on another study of 10,000 underground and 2,700 surface men in 8 collieries in 1927–1928.

TABLE 88.—ACCIDENT RATES IN COLLIERIES IN RELATION TO TEMPERATURE
(*I.F.R.B. Report* 51 and *I.H.R.B. Report* 62)

Average temperature, deg. F.	Accident frequency		Accident severity	
	1924–1925	1927–1928	1924–1925	1927–1928
63.9	104	133	3.5	4.4 Coal face workers
77.3	144	144	3.6	3.8 Coal face workers
82.8	184	173	4.5	4.8 Coal face workers
62.0	58	57	1.84	1.79 Other underground workers
72.7	87	81	2 41	2.45 Other underground workers
78.5	100	92	2.29	2.63 Other underground workers

In both these studies for both groups of workers, the number and severity of the accidents showed a marked increase as the temperature rose; a rise of 18° in temperature paralleled an increase of 80 per cent in accidents among the coal face workers, and a rise of 16° paralleled an increase of 73 per cent in accidents among other underground workers.

In another study made under the auspices of the Industrial Fatigue Research Board by Musico,[1] the effect of temperatures at different times of the day in two factories—projectile and shell—was consistently evident. Table 89 summarizes the findings.

TABLE 89.—ACCIDENT FREQUENCIES AT DIFFERENT TIMES OF THE DAY UNDER DIFFERENT TEMPERATURE CONDITIONS

Time of day	Temperature range						
	−50	50–54	55–59	60–64	65–69	70–74	75+
1:00–3:15 A.M.		1.0	.92	.99	.86	.57	
4:45–7:00 A.M.		1.0	1.02	.80	.70	.33	
10:15 A.M.–12:30 P.M.		2.0	1.61	1.50	1.48	1.39	1.42
2:30 P.M.–5:00 P.M.		2.0	1.75	1.40	1.51	1.03	1.38
9:45 A.M.–12:45 P.M.	1.65	1.33	1.07	.91	1.00	.75	
10:15 P.M.–1:15 A.M.	1.41	1.27	1.17	.95	.83	2.00	

From the above table it will be seen that the average accident rate when the temperature was in the 70–74 range was consistently lower than that at any other range, regardless of the time of day in which the work was carried on; and that when the temperature was below 55 or above 75, a higher accident frequency was found than at any other time.

[1] MUSCIO, *loc. cit.*

The accident rate during the night shift as contrasted with the day shift has been the subject of a number of reports. Vernon's studies in factories and mines in Great Britain have shown results similar to those from studies made in the United States. One report will reveal the trend. Ryan made a study of the accident frequency among workers in motorcar factories in the United States in 1921,[1] and reported the results of 40,000 accidents as given in Table 90.

The consistency with which accidents are at their maximum during the last hours of the day shift and the first hours of the night shift would indicate that something other than fatigue is responsible for the frequency. The importance of these factors will be discussed in the section that discusses the personal causes of accidents.

How to remedy atmospheric conditions so that the varying effect on the worker will be reduced to a minimum has been the problem of safety engineers for some time. Generalizations concerning remedies are useless, as conditions vary from plant to plant; the most frequent recommendation given by safety engineers today is the use of panel heating,[2] in which large areas of the floor, walls, and ceiling are heated to a moderate temperature by concealed coils of hot-water pipes. The advantages of such a system are an even distribution of heat, warmer conditions at the foot than at the head level, and a feeling of comfort at temperatures from 1 to 2.5 degrees lower than necessary for comfort in convection-heated rooms.

TABLE 90.—HOURLY ACCIDENT RATES AMONG FUSE WORKERS

Working hours	Accidents per unit of output,[1] per cent	
	Day shift	Night shift
1st	72	108
2d	88	159
3d	95	145
4th	100	100
5th	93	104
6th	79	95
7th	99	37
8th	100	85
9th	105	92
10th	117	92

[1] The hourly accident rate is expressed in the form of the number of accidents per unit of output.

[1] RYAN, A. H., Accidents and Output in U. S. Fuse Factories, *Journal of Industrial Hygiene*, 2:466, 1921.

[2] See *Industrial Fatigue Research Board Report* 46 and *Industrial Health Research Board Report* 58.

II. Illumination.—The importance of proper lighting can best be shown by giving some facts that have been discovered regarding the effects of poor illumination on both efficiency and accident frequency.

A. Effects on Efficiency.—The decrease in efficiency because of inadequate illumination is shown in a study made by the National Industrial Fatigue Research Board.[1] The graph in Fig. 25 gives the record of work under two conditions, which differ from one another only in the degree of illumination present.

It will be noticed that not only was the output lower in the first hour of the morning when artificial illumination was used, but that it remained lower during every hour of the day, with the exception of one period.

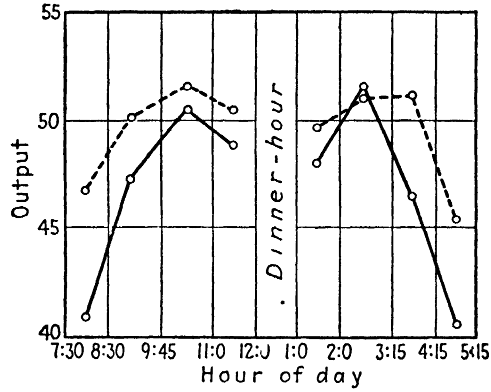


FIG. 25.—Average 3 weeks' production record under daylight and artificial light. The solid curve represents the average hourly output for 3 weeks, January 5 to 24, in which artificial illumination was used during the first and last hours of the day, while the dotted curve represents the average hourly output for 3 weeks, February 16 to March 6, when no artificial illumination was used. (*Industrial Fatigue Research Board Report* 9.)

The change in efficiency, as measured by production record and number of errors made because of changes in illumination, has been the subject of numerous studies. Some of the results from a number of researches are collected in Table 91.[2]

Further proof of the beneficial effects of improvements in the lighting system in both increase in production and decrease in errors is given in reports issued by the research department of the General Electric Company.[3] The graph in Fig. 26 represents the changes in production and error record after the lighting system had been changed from an intensity of 8 foot-candles to one of 60. The key-punch operators

[1] See *Industrial Fatigue Research Board Report* 9, 1920.

[2] The figures are taken by permission from WELCH and MILES, *op. cit.*, pp. 98–99; and from JENKINS, J. G., *Psychology in Business and Industry*, p. 195 John Wiley & Sons, Inc., New York, 1935.

[3] The data and graph have been furnished by R. L. Oetting of the Nela Park Engineering Department of the General Electric Company.

whose average records are given in the graph were able under the new lighting system to approach the index speed of their machines, thus increasing production rate by 58 per cent, at the same time that they reduced the errors by 69 per cent.

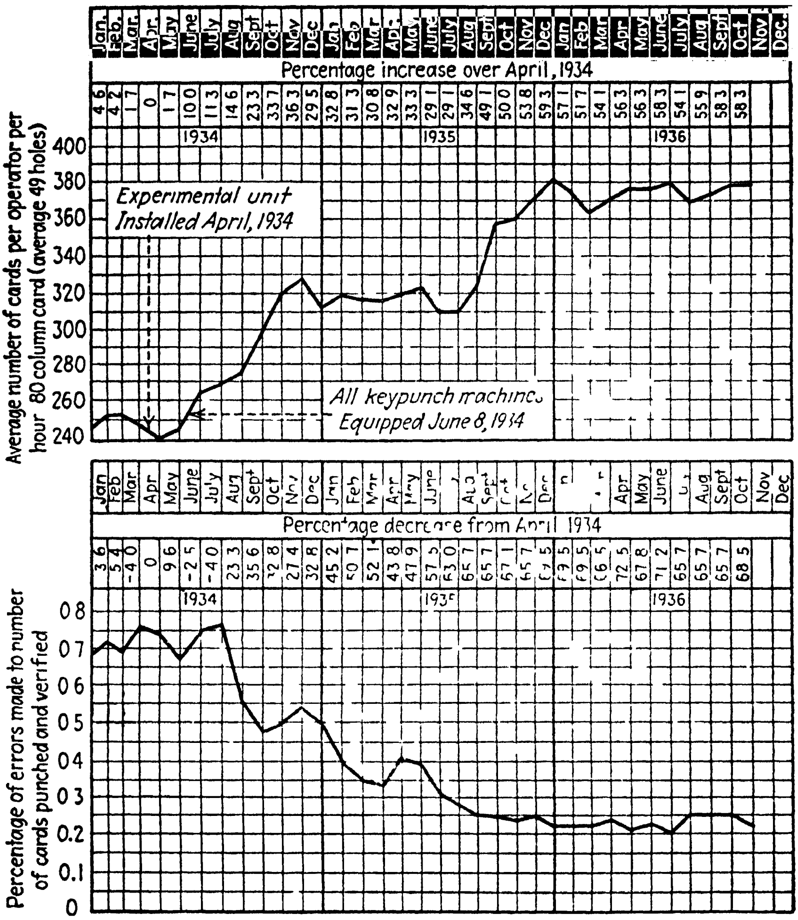


FIG. 26—Tabulating card production and percentage of errors before and after the installation of lighting brackets and paper shelves on key-punch machines (*Courtesy of the General Electric Company.*)

These results give fairly conclusive proof that there are optimum lighting conditions for each job, the intensity and nature of which can usually be found only through experimentation; a marked increase in intensity in one place may not produce results commensurate with the additional expense; the power necessary must be determined in terms of comfort for the person with normal visual acuity, and production records.

TABLE 91.—CHANGES IN WORK EFFICIENCY UNDER DIFFERENT ILLUMINATIONS

Type of work	Degree of illumination, in foot-candles[1]	When compared with	Changes in	
			Production, per cent	Errors, per cent
Typesetting	2.0	Daylight	−25	+100
Typesetting	7.0	Daylight	−10	Little
Typesetting	20.0	Daylight	0	0
Sorting mail	7.2	3.3 f.c.	12+	
Sorting mail	5.9	3.3	20+	
Sorting mail	8.0	3.6	4+	
Manufacturing plant	11.4	3.8	8.5+	
Pulley finishing	4.8	2.0	35+	
Metal bearings	12.7	4.6	15+	
Steel machinery	11.5	3.0	10+	
Carburetor assembly	12.2	2.1	12+	
Iron manufacturing	13.5	.7	12+	
Buffing shell sockets	11.4	3.8	8.5+	
Letter sorting	8.0	4.4	3.6+	

[1] A foot-candle is the illumination received at a point 1 foot distant from a source of one-candle power and perpendicular to the light rays at that point.

B. Effects on Accident Frequency.—Numbers of studies have shown a close relation between accident frequency and lighting conditions. The Travellers' Insurance Company[1] estimated that of the 91,000 accidents that were reported in one survey, 24 per cent were due to imperfect lighting.

TABLE 92.—ACCIDENTS IN RELATION TO NATURAL AND ARTIFICIAL LIGHTING

Industry	Total accidents	Percentage increase during artificial lighting	
		All accidents	Persons falling
Docks	9,454	51	102
Textile	17,124	46	76
Drink	2,198	35	52
Engineering	37,408	32	93
Shipbuilding	16,449	22	99
Founding metals	7,779	6	99
Building	1,759	−17	12
Other industries	69,290	26	56
Total or mean	161,461	25	74

[1] *Accident Prevention Pamphlet* 1, National Safety Association, 1923.

Studies made by the Departmental Committee on Lighting of factories and workshops in Great Britain[1] report the percentage increases in accidents attributable to poor artificial lighting that are reproduced in Table 92.

The striking fact about these reports is that on docks and in shipyards and metal foundries there were twice as many accidents due to persons falling during artificial as during natural lighting.

A study made by Stephenson[2] on the effects of artificial light, as compared with natural light, on accident rate showed an average increase of 36 per cent under artificial light. His results showed a significant increase in accident rate during the first hour of each day when artificial light is used; that is succeeded by a period of adaptation with approximately daylight accident rate; and then follows a large increase in rate (140 per cent in his study), due to the more rapidly fatiguing eye condition under artificial light.

These reports give fairly conclusive proof of the improved level of work and decreased susceptibility to accidents under scientifically lighted or daylight workshop conditions Other things being equal, in a well-lighted shop there will be fewer mistakes made, less waste, and fewer accidents than in one with poor illumination. But adequate illumination depends upon a number of factors, some of them inherent in the situation and some peculiar to the individual. Among the most important factors are

a. The size of the object or the size of certain critical details.
b. The distance of the object from the eye.
c. Its contrast with the background.
d. The brightness of the object, which depends upon its power of reflection and on the degree of illumination.
e. The time that is available for seeing.
f. The color, brightness, and pattern of the surroundings.
g. The ability of the eyes, their freedom from defects.
h. The ability of the person, especially in relation to the particular job, his intelligence, his powers of adaptation, his experience, his reaction time, his powers of concentration, and his capacity to resist distractions.

These variables are generally considered in installing a satisfactory lighting system, and are customarily equated in terms of a *general* lighting system, for the office or shop as a unit, and a *supplementary* lighting system, for the particular demands of any job. These demands are determined by the quantity of illumination necessary for accurate discrimination, and the quality of illumination necessary for avoiding discomfort to the worker and undue strain on the eyes.

[1] Summarized in VERNON, *op. cit.*, p. 85.

[2] STEPHENSON, A., Effects of Artificial Light on Accidents, *Jour. Nat. Inst. Industrial Psychol.*, 3: 196, 1926.

1. *The Quantity of Illumination.*—The human eye is capable of adapting itself to illuminations that range from a fraction of a foot-candle to several thousand foot-candles. The brightest light to which it is occasionally exposed, sunlight, produces an intensity of from 6,000 to 10,000 foot-candles; the dimmest light under which it is possible to make rough discriminations is but a small fraction of 1 foot-candle. In between these extremes there is a desirable intensity for each type of work. In general, if provision is made for avoiding glare and producing uniformity, the higher the intensity of light the better.

The ideal intensity of illumination is often quoted as being that experienced when sitting at midday under the shade of a tree, and the intensity there is about 1,000 foot-candles. That, however, is rarely experienced in indoor areas; a great deal of work in shops is done under an intensity of 3 foot-candles or less. The amount that is required varies in different situations. The Illuminating Engineering Society has issued a lighting code for different working conditions, in which the minimum and desirable amounts of light are given—reproduced in Table 93. Dr. Luckiesh, of the General Electric Company, recommends higher intensities than those suggested by the I.E.S. when one is working for any long period of time at tasks that require close attention. His recommendations are to be found in a pamphlet, *Illumination Design Data,*

TABLE 93.—THE I.E.S. LIGHTING CODE FOR WORKING SITUATIONS[1]

Type of work or condition	Foot-candles	
	Minimum	Desirable
1. Roadways, yards, thoroughfares	0.02	0.05–0.25
2. Storage spaces, aisles, and passageways in workrooms, excepting exits and passages leading thereto	0.25	1–2
3. Where discrimination of detail is not essential, *e.g.*, hallways, stairways, exits, entrances, toilet rooms, elevators, work involving handling material of rough nature	0.5	2–5
4. Where discrimination of detail is slight, *e.g.*, passage and stairways above moving machines, hot pipes, live electric wires, rough assembly, benchwork, forging, milling	1	2–5
5. Where discrimination is moderate, *e.g.*, machinery, assembly work, fine benchwork, fine core making in foundries, cigarette rolling	2	5–10
6. Where discrimination is close, *e.g.*, fine lathe work, pattern making, toolmaking, weaving light-colored silk or woolen textiles, office work, accounting, typewriting	3	5–10
7. For minute details, *e.g.*, watch repairing, engraving, drafting, sewing on dark material	5	10–20

[1] Code of Lighting: Factories, Mills, and other Work Places, *Bull.* 331, U. S. Department of Labor, Bureau of Labor Statistics, 1923.

published in 1936 by The Nela Park Engineering Department of The General Electric Company, Cleveland, Ohio.

These standards were issued in 1923, and the tendency since then has been to increase the level of illumination, as repeated experiments have shown that under high levels of illumination there are (*a*) increased ability to perceive objects (it takes three and one-half times as long for the eye to perceive a small object under 2 foot-candles as it does under 100 foot-candles); (*b*) increased speed of discrimination, *i.e.*, in the rapidity with which the eye is able to identify a difference or differences in objects (an increase of from 1 to 12 foot-candles increases the speed of discrimination from one to three and one-half times); (*c*) increased powers of accommodation, *i.e.*, the speed with which the eyes focus upon objects at different distances; (*d*) increased ability to keep a clear view of all the details of an object that is under continuous observation; and (*e*) an increase in speed of reading.[1]

However, the amount of light that is needed varies with the worker as well as with the work situation. Ferree and Rand[2] have shown that the amount of light that is needed varies considerably with the age of the worker. For younger workers whose eyes are free from defects, a high level of acuity is experienced at 10 foot-candles of illumination, and there is not much benefit derived from great intensities. For the middle-aged man and early old-aged workers, there is a low level of acuity at low and medium light intensities, but as the light increases, the acuity increases, and at high intensities of illumination, there is a high level of acuity. For the old workers there is a low level of acuity throughout, and an increase of intensity beyond 20 foot-candles does not increase acuity to any appreciable extent.

The intensity of the illumination that would fall on any object can quickly and easily be measured by means of a photometer, placed in the position of the object; of these there are many well-known forms. Rumford's, Bunsen's, and Lummer's are frequently used. A convenient portable form, called the light meter, which has been developed by the General Electric Company, measures intensities up to 75 foot-candles, and up to 750 foot-candles with the use of a multiplying plate. An illustration of this light meter is given in Fig. 27.

2. *The Quality of Illumination.*—Quality of illumination is dependent upon three factors: diffusion, distribution, and color value. Regardless of the quantity of illumination, its effects may be impaired because of the unevenness, the glare, or the faulty direction of the light.

[1] HARRISON, W., and K. A. STALEY, *Fundamentals of Illumination*, The General Electric Company, Cleveland, Ohio, 1931.

[2] FERREE, C. E., and G. RAND, Sight and Intensity of Light, *Personnel Jour.*, 16: 18–25, 1935–1936.

a. Diffusion. This is the process of reflection of light by a reflecting surface or of transmission of light through a translucent material. This factor presents itself in the form of the problem of glare, *i.e.*, brightness of such a character as to cause annoyance, discomfort, interference with vision, and eye fatigue. Glare is of two kinds, direct and reflected.

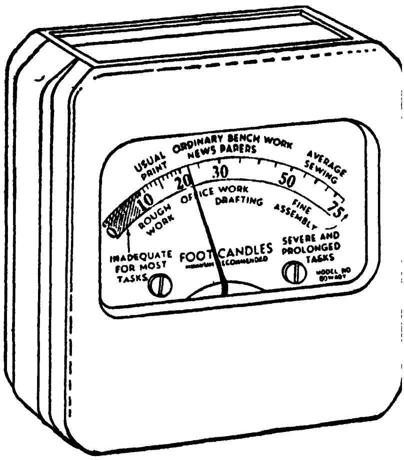


FIG. 27.—The light meter. (On the back of the meter are shown the recommended minimum foot-candle values for different types of work.) (*Courtesy of the General Electric Company.*)

Direct glare comes directly from the light source to the eye, and depends for its effects upon the position of the light source in the field of view and on the contrast in brightness between the light source and its background. The importance of the source of light varies according as it is constantly or only occasionally in the central portion of the visual field. If the source is in the central portion of the visual field continually, or for a long period of time, "the brightness should be no greater than ½ candle per square inch of apparent area if it is not to fatigue the eyes."[1] If it comes into one's field of vision only occasionally, the danger may be avoided by the use of either the indirect or the semi-indirect lighting system. The indirect system uses

TABLE 94.—PERCENTAGE LOSS IN READING EFFICIENCY UNDER DIFFERENT SYSTEMS OF ILLUMINATION

System of illumination	Per cent loss after	
	Two hours	Three hours
Daylight	5	6
Indirect	10	9
Semi-indirect	34	72
Direct	37	81

opaque bowls with a lamp above them, so that all the light is reflected from the walls and ceiling. The semi-indirect system is of the same type, except that the bowl is translucent and some of the light filters down directly on the work. The relative values of the two systems is indicated in a study of the effects of reading under different systems of illumina-

[1] HARRISON and STALEY, *op. cit.*, p. 42.

tion, made by Ferree and Rand,[1] in which an estimate was made of the percentage of loss in reading efficiency under both conditions. Table 94 gives the results.

These results, however, vary with different subjects, and indicate that the problem of glare is an individual one, and "the most acute problem in modern lighting." The factors that determine one's susceptibility to glare vary from person to person, and render general treatments unsatisfactory. Ferree and Rand list these factors as follows:[2]

Age, size of pupil, condition of the media of the eye, health of the eye and general health, marked asymmetry of refraction of the two eyes, high myopia and refractive errors that produce an irritable and supersensitive condition of the eye, ocular and bodily fatigue, loss of sleep, insomnia, etc., as well as the following objective factors: reflecting power of the surface used and character of reflection, size of reflecting surface, intensity of light, angle at which light falls on the work and breadth of angle of incident light, high brightness in paracentral and peripheral field of view and their angular relations to the line of light.

Reflected glare is glare that comes to the eyes as glint or reflection of the light source from some polished surface.

It is often more objectionable than direct glare and quite frequently more harmful because of its insidiousness and because it is generally from a direction below the horizontal, a zone in which the eye has no natural protection. This form of glare, known as specular reflection or veiling glare, is frequently encountered when a person looks at glossy paper, polished metal, wood, or other shiny surfaces. It is especially harmful because the eye is often subject to it for long periods of time.[3]

The usual preventive measure adopted to avoid its effects is to locate the light source in such a position with respect to the work that the specularly reflected light will be thrown away from, rather than toward, the eyes.

b. Distribution. In this connection there are two problems that must be solved if workers in all parts of the office or shop are to be given adequate protection: (1) *Uniformity of illumination*, so that all parts receive sufficient light intensity. The variations in different parts of one office are indicated in one report[4] in which registered intensities were 100 foot-candles at the window, 27 at a desk near the window, 5 at a desk in the middle of the office, and 1 at a corner desk. To overcome

[1] FERREE, C. E., and G. RAND, The Power of the Eye to Sustain Clear Seeing under Different Conditions of Lighting, *Jour. Educ. Psychol.*, 8: 451–468, 1917.

[2] FERREE, C. E., and G. RAND, Better Lighting for Workers, *Personnel Jour.*, 15: 209–210, 1936.

[3] HARRISON and STALEY, *op. cit.*, p. 43

[4] BROWN, W. C., and D. M. WARREN, Lighting for Seeing in the Office, *Bull.* of the General Electric Company, Cleveland, Ohio, 1936.

these discrepancies, the usual recommendation is to space the light sources so that the distance between any two is not more than one and one-half times the height above the work plane, and to supplement the general lighting system with specially shaded lights in places where work requiring close observation is being carried on. An illustration of the effects of changing light-source heights is given in a change reported by Welch[1] in a spinning mill, where the light source, which was from 100-watt bulbs at a height of 10 feet 6 inches, was reduced to 60-watt bulbs at a height of 7 feet 6 inches, with a reported improvement in illumination and a saving of $90 per year in lighting costs. (2) *The elimination of shadows.* For some types of work the presence of shadows is an aid; soft, well-illumined shadows are helpful in distinguishing form and detail; when, on the other hand, the shadows are sharp and black, they make objects appear harsh and unpleasant, produce great contrasts in brightness, and sometimes hide moving parts of machinery. Elimination of such shadows is effective when the light units are reasonably close together,[2] especially if the indirect system of lighting is used; if shadows are desirable, the semi-indirect system can be effectively used to secure any degree of shadow, if glass of the proper density is chosen

TABLE 95.—REFLECTION VALUES OF DIFFERENT COLORS

Colors	Approximate percentage of reflected white light
White	85
Ivory	77
Cream	66
Yellow	60–75*
Buff	56
Yellow-green	50–70*
Silvery gray	50
Light blue	50
Cream over blue-stippled	45
Ivory over sage green-stippled	40
Ivory over white-stippled	40
Gray over white-stippled	40
Sage green	40
Light red	35–55*
Light blue	35–50*
Olive green	20
Cardinal red	20

* The starred percentages are taken, by permission, from WELCH, H. J., and G. H. MILES, *Industrial Psychology in Practice*, p. 114, Sir Isaac Pitman & Sons, London, 1936, and the unstarred percentages from BROWN, W. C., and D. M. WARREN, Lighting for Seeing in the Office, *General Electric Bull.*, Cleveland, Ohio, 1936, p. 33.

[1] WELCH and MILES, *op. cit.*, p. 101.

[2] Specific directions for spacing and height of lights are given in *Bulletin* LD-6, Illumination Design Data, General Electric Company, Cleveland, Ohio, 1936.

c. Color. This is important in two respects. (1) Light should be of such a color quality that objects are seen in their true colors; in many types of work a small difference in color must be recognized, and unless the artificial light approximates the color of natural light, such distinctions cannot be made; for example, when one looks at a brass bushing on a steel machine part, the two metals, brass and steel, may have exactly the same reflection factor and they may be indistinguishable under a light that does not show their true colors. A close approximation to natural light for such situations is realized by using blue-glass bulbs or enclosing globes of special blue glass; the north skylight produces the most effective condition for such situations. (2) The reflecting properties of different colors, particularly those on the walls, ceilings, and surroundings, should be considered. The amount of light reflected from the surroundings is as great a factor in producing discomfort as is the direction from which the light comes. If a person constantly has to face a large expanse of wall surface that is finished in so light a color that a large amount of light is constantly being reflected in his eyes, the cumulative effect is an increase in fatigue and accidents, and a decrease in production. If the brightness of the walls is equal to, or greater than, the brightness of a white paper lying on a table or a desk, annoying glare will result; walls reflecting more than 50 per cent of the light that strikes them are discomforting to the average worker. Table 95 indicates the amount of light reflected by different colors.

The amount of reflected light depends upon the candle power of the source, the distance of the light from the surface, and the angle of incidence of the rays upon the surface. Reflection coefficient surface values range from .005 (black velvet) to .90 (magnesium carbonate). The color desirable for the walls and ceiling depends upon the lighting system used; semi-indirect and totally indirect systems require white or very light ceilings and upper side walls; generally, walls that are finished in buff, light-green, or gray tints reflect about the proper proportion of light. But the lighting system can be solved only when the demands of each job are considered. As Miles says,[1]

> Every job has its own lighting problems, and you can get at them only if you consider the point of view of the men who do the job. You must take the position of the worker and adjust the lighting so that he gets the right type of light—the right quantity, the right quality, the right direction, and sometimes the right color.

III. Rate of Production.—The influence of production rates upon both accuracy of work and accident frequency has been studied in a number

[1] MILES, G. H., Psychological Aids to Increased Production, *The Human Factor*, 8: 347, 1934.

of experimental situations and work situations. Its effects upon accuracy were tested by Muscio in an aiming and pendulum test.[1] The problem that he gave his subjects in the aiming test was to spear a number of disk-shaped targets with a dissecting needle, which was held vertically in the right hand. The subjects were seated, and the target sheets were placed on a cardboard holder which lay flat on a table. Three successive trials were given each subject, who aimed at a target at a rate varying from 60 to 210 metronome beats per minute. The accuracy of each aim was determined by the number of half-millimeter deviations from the bull's-eye that the subject made in 180 shots. Table 96 gives the records of two subjects and the average of six.

TABLE 96.—NUMBER OF HALF-MM. DEVIATIONS IN RELATION TO METRONOME BEATS

Subject	Average errors for metronome rates						Total errors
	60	90	120	150	180	210	
A	223.5	228	326	406.5	542.5	684.5	2411.0
F	135	163.5	194.5	224.5	321.5	367.5	1406.5
Average for six subjects	176.8	180.3	223.3	301.3	413.1	506.1	1801

It will be noticed that, as rate increased, inaccuracies increased, and that the increase in both varied directly throughout the series. It was the consistency of these results that led Muscio to conclude that "increase in rate of movement causes an increase in the inaccuracy of movement."

In work situations, the study made by Vernon[2] of workers in a fuse factory gives results that are representative of those found in any factory under rush conditions. Table 97 gives the number of cuts and bruises for six periods of 4 months each, during which there was constant pressure for increased production, owing to war demands.

TABLE 97.—ACCIDENT RATE COMPARED WITH PRODUCTION RATE IN A FUSE FACTORY

Period of study	Average weekly hours of work	Average hourly output	Cuts per 10,000 workers per week
Feb. 1 to May 1, 1916	52.2	113	358
May 2 to Aug. 31, 1916	51.7	124	379
Aug. 22 to Dec. 18, 1916	51.8	130	418
Dec. 19 to Apr. 1, 1917	46.8	137	477
Apr. 2 to Aug. 4, 1917	44.9	140	573
Aug. 12 to Dec. 15, 1917	51.9	147	489

[1] MUSCIO, *op. cit.*, pp. 18–36.

[2] VERNON, H. M., *Memo* No. 21, p. 24, Health of Munitions Workers Committee, 1918.

This table shows that, as production rate increased, the number of bruises increased, despite the fact that the average number of hours of work per week decreased for four of the five periods; an increase of approximately 25 per cent in hourly output was accompanied by an increase of from 50 to 60 per cent in accident frequency.

In addition to atmospheric conditions, lighting, and rate of production, there are a number of environmental factors that contribute to both frequency and severity of accidents. Many of them, as well as those responsible for accidents, make as great a contribution to the fatigued state of the worker as they do to his accident possibilities, and will be discussed in Chap. XIII under the general problem of fatigue.

PERSONAL CAUSES

The importance of personal factors in both accident frequency and severity has been recognized for some time. As long ago as 1918, H. M. Safety Committee on Workshops and Factories reported,[1]

> It is perhaps not generally realized that machinery is responsible for only a minority of the accidents that occur in factories and workshops. The Home Office records show that more than two-thirds of such accidents are due to other causes. The annual reports regularly show that a great number of accidents are due simply and solely to carelessness, inattention, and want of thought. It has been estimated that the percentage of avoidable accidents in some industries is as much as 60 per cent.

But the surprising factor about these accidents is that they are not caused by all the workers; there is a considerable percentage of workers who have an accident-free record, while a small percentage are responsible for the great majority of accidents. Accident distribution is not purely chance distribution; there are some workers in any group who are more liable to accidents, under equal conditions of work, than are other workers in the same group; it is this small percentage—*the accident-prone* workers—who are responsible for the majority of personally caused accidents. Proof of this fact is given in a number of studies.

In a recent survey[2] of 2,651 accidents among 625 employees, Slocombe found that while 442 employees had 908 accidents, or an average of 2.1 each, 183 employees had 1,733 accidents, or an average of 9.5 each.

In a study made by Greenwood and Woods[3] of the accident frequency among 198 women factory workers for a 17-month period, the rate per

[1] *Report* of H. M. Safety Committee on Workshops and Factories, p. 44, London, 1918.

[2] SLOCOMBE, *op. cit.*, pp. 131–141.

[3] GREENWOOD, H., and H. M. WOODS, The Incidence of Industrial Accidents upon Individuals with Specific Reference to Multiple Accidents, *Industrial Fatigue Research Board Report* 4, 1919.

month of the "no-accident" group was compared with the rate for the "accident-prone" group. Typical results are given in Table 98. The accident-prone group averaged from one and one-half to six times as many accidents per month as did the no-accident group.

Another study, by Karl Marbe,[1] showed the same tendency.

The accident record of 3,000 active commissioned and noncommissioned officers in the German Army was kept by an insurance company and divided into two periods of 5 years each. The results from the first 5 years were divided into three groups—no-accident, one-accident, and multiple-accident—and the average number of accidents of each group was compared with the record during the second 5-year period; the no-accident group averaged 0.52 accident for the second period, the one-accident group averaged 0.91, and the multiple-accident group averaged 1.34. In another study of the same group, Marbe[2] divided the officers into 10 groups of 300 each, and then subdivided each group into "non-accident susceptibles" and "accident susceptibles," and compared the number of accidents of each group during the first 2 and last 2 years of the 10-year period; the former group averaged 0.24 accident against an average of 0.42 for the latter group.

TABLE 98.—ACCIDENT FREQUENCY OF THE "NO-ACCIDENT" AND "ACCIDENT-PRONE" GROUPS
(After Greenwood and Woods)

Month	Mean number of accidents per month	
	No-accident group, 136 women	Accident-prone group, 62 women
February	0.00	1.31
March	0.06	0.65
April	0.30	0.45
May	0.10	0.21
June	0.26	0.40

In another study of soldiers' accidents, Marbe[3] grouped the soldiers into three danger classes: those engaged in office work, those engaged in outdoor duties but not exposed to special dangers, and cavalrymen and others who were exposed to considerable danger. He compared the number of accidents of each group with those of the others. His conclusion was that "the number of accidents suffered by any individual in a prescribed period bore less relation to his danger class than to the num-

[1] Quoted by VERNON, H. M., *Accidents and Their Prevention*, p. 35, The Macmillan Company, New York, 1937.

[2] MARBE, K., The Psychology of Accidents, *The Human Factor*, 9: 100–104, 1935.

[3] VERNON, *op. cit.*, p. 101.

ber of accidents suffered in the previous period." It was these studies that led Marbe to conclude, "accident-prone people have a psychophysiological predisposition towards accidents which predisposes them to injury in almost any occupation." They also gave him the basis for his law of recurrence, *i.e.*, the chances that people who have had one, two, or more accidents will have of sustaining a proportionately greater number of additional accidents.

If a small percentage of workers is responsible for the majority of accidents, the important issue is to discover the factors in these people that make them accident susceptible. What are these factors, and what can be done to remove the tendency?

Marbe suggests that these causes can be reduced to such factors as inability to concentrate, incapacity to distribute attention, slow reaction time, absent-mindedness, proneness to fatigue, and addiction to alcohol.

Bristol[1] suggests, from his clinical analysis of accident-prone workers, that the chief factors contributing to the conditions are ineffectiveness of the visual apparatus, slow reaction time, reduced energy and fatigue, poor distribution of attention, and inadequate control of reflexes.

Snow[2] attributes accidents among cab drivers of the Yellow Cab Company to the following personal factors: recklessness, carelessness, emotional instability, lack of foresight, health, temporary prepossessing ideas, and physiological defects.

Bingham,[3] from a clinical study of 141 cases of accident-prone drivers, classified the causes as follows: lack of knowledge or understanding, 30; poor judgment of distance, 19; poor judgment of speed, 15; insufficient experience, 14; poor sensorimotor coordination, 9; excessive perseveration, inability to distribute attention, oscillation of attention, 7 each; chronic hurry, 6; susceptibility to fatigue, slow reaction time, nervousness or fear, 5 each; poor attitude and impulsiveness, 3 each; and excitement or worry, 2.

In an elaborate study of the test records of accident-prone drivers in comparison with the free-from-accident drivers, De Silva[4] reports that the former group are a little poorer than the latter in coordination, reaction time, ability to do several things at once, visual keenness, glare vision, and depth perception, and that "there is a small group of bad drivers who can be variously described as being incapable, untrained,

[1] Bristol, L. D., Medical Aspects of Accident Proneness, *Journal of the American Medical Association*, 107: 653–656, 1936.

[2] Snow, A. J., Tests for Chauffeurs, *Industrial Psychol.*, 1: 30–45, 1926.

[3] Bingham, W. V. D., Personality and Public Accidents, A Study of Accident-prone Drivers, *Trans. Seventeenth Annual Safety Congress*, National Safety Council, 2, 1928.

[4] De Silva, H., Facts about Automobile Drivers, *Harvard Alumni Bulletin*, Jan. 21, 1938, p. 2.

irresponsible, thoughtless, overconfident, or any combination of these traits."

In 1929, the Cleveland Railway Company, in cooperation with the Metropolitan Life Insurance Company, made a study of all their trainmen with high accident records.[1] The 50 high-record men were selected for

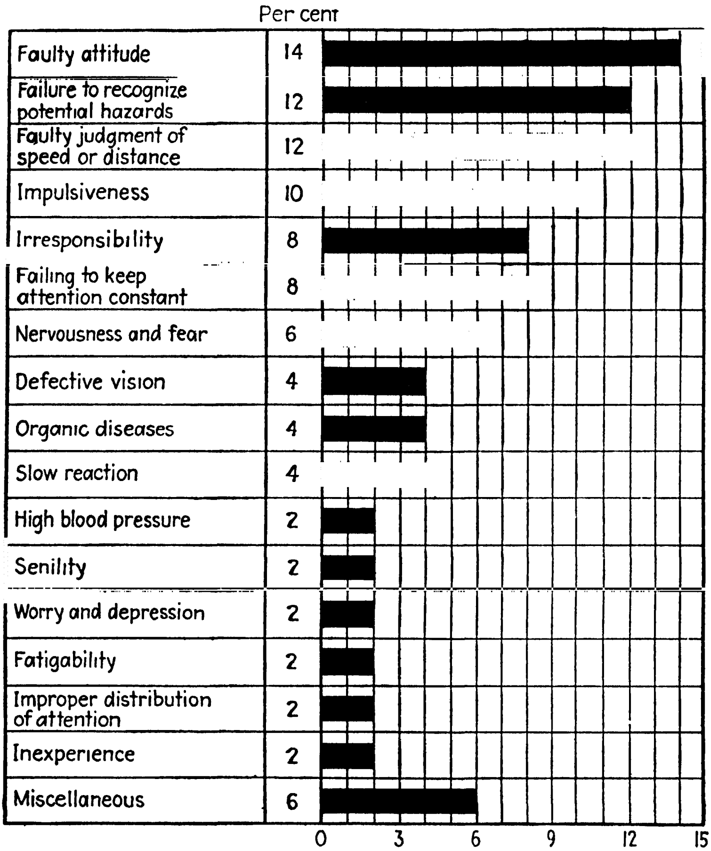


FIG. 28.—Primary causes of accident susceptibility; percentage distribution among 50 motormen of the Cleveland Railway Company. (*The Accident Prone Employee, The Metropolitan Life Insurance Company, New York,* 1930.)

study, and in each case a complete clinical picture of the operator was secured. The results showed that in most instances there were several causes responsible for each accident, but that one of these causes was of primary importance. The percentage of these "primary" causes is given in Fig. 28.

[1] *The Accident Prone Employee,* The Policyholders' Service Bureau, The Metropolitan Life Insurance Company, New York, 1930.

A regrouping of these primary causes shows that operating defects, such as "failure to recognize potential hazards," "faulty judgment of speed and distance," and "improper distribution of attention," were responsible for 66 per cent of the accidents; personality maladjustment, for 22 per cent; and physical difficulties, such as, "defective vision," "organic diseases," "high blood pressure," and "senility," for only 12 per cent.

STUDIES OF PERSONAL FACTORS IN ACCIDENT SUSCEPTIBILITY

Among these various personal factors to which accident proneness is attributed some have been isolated for individual study. Among them the importance of age and experience, emotional state, physical condition, alcohol, and mental attitude has been well established.

1. Age and Experience.—Repeated surveys have given proof to support the claim that lack of experience is one of the prime factors responsible for accident frequency. Humke reports[1] that 50 per cent of the accidents occurring during the first 4 months of employment happen in the first month. Fisher gives repeated proofs of the gradual decrease in accident frequency as experience increases. One of his reports among workers in a textile mill is reproduced in Table 99,[2] in which accident rate is checked against experience ranging from less than 1 month to more than 50 years.

TABLE 99.—RATE OF ACCIDENTS IN RELATION TO LENGTH OF SERVICE

Length of service	Number of		Accident rate, per cent
	Accidents	Employees	
Less than 1 month	74	41	181
1 month–less than 3 months	121	96	127
3 months–less than 8 months	217	249	87
8 months–less than 12 months	114	183	62
Less than 1 year	526	569	92
1 year to less than 5 years	430	750	57
5 years to less than 10 years	125	267	47
10 years to less than 20 years	119	223	53
20 years to less than 30 years	59	164	36
30 years to less than 40 years	33	75	44
40 years to less than 50 years	22	33	67
50 years and over	0	4	0

[1] HUMKE, H. L., First Month Found Most Dangerous, *Personnel Jour.*, 14: 336–337, 1936.

[2] FISHER, B., *Mental Causes of Accidents*, p. 34, Houghton Mifflin Company, Boston, 1922.

Gates[1] reports a decrease in accident rate that is directly related to the age of the employee; for ages fifteen to twenty, the rate is 30 per 100; twenty-one to twenty-five, 19 per 100; twenty-six to thirty, 17 per 100; thirty-one to thirty-five, 12 per 100.

On the other hand, there is some proof that after the preliminary experience is ended and the young novice has become adjusted to his task, he has a smaller number of accidents and less severe ones than do workers of more experience. In Table 100[2] Stevens reports a marked increase in fractures as age increases, and a 50 per cent increase in sprains, punctures, cuts, bruises, and contusions.

TABLE 100.—ACCIDENT IN RELATION TO AGE
(After Stevens)

Age of workers, in years	Number of cases	Average weeks lost per case
−20	413	5.3
20–29	1,643	7.8
30–39	1,285	10.4
40–49	877	12.9
50–59	449	17.4
60+	161	17.2

The discrepancy between the different results is due to associating two factors—age and experience; the two do not always go together. It is true that lack of knowledge or of the possession of the necessary skills, ease of disturbance in new situations, undue self-confidence or self-consciousness, and habits of pretense and bluffing are more likely to characterize youth than middle age, and that these factors are directly responsible for accidents; but there is no proof that increasing age is necessarily related to accident infrequency. If any generalization can be made, it is that when the length of service is the same the older workers will tend to have fewer accidents than the younger, and when the age is the same those with a great deal of experience in a particular type of work will have fewer accidents than those with little or no experience. The facts seem to show that up to ages forty to fifty, length of experience is inversely related to accident frequency, but that after that period accidents tend to increase with age.

2. Emotional Stability.—It is commonly recognized that any disturbing condition that temporarily upsets one's equilibrium distorts

[1] GATES, D. S., A Statistical Study of Accidents in Cotton Mills, Print Mills, and Worsted Mills of a Textile Company, *Jour. Industrial Hygiene*, 2: 8, 1920.

[2] STEVENS, A. F., Accidents of Older Workers: Relation of Age to Extent of Disability, *Personnel Jour.*, 8: 138–145, 1929.

one's capacity for making sound judgments and proper muscular coordinations. This is particularly true on the part of those who easily become victims of excitement and worry. Any unusual situation, such as suddenly imposed tasks, increased efforts at speed, unusual remarks from one in authority, or any change in the environmental situation, accentuates an ever-present tendency and temporarily unbalances the person. This condition is particularly true of the accident-prone person; studies of extreme cases show them to be more excitable and more easily upset, and to possess more psychoneurotic symptoms than the average worker. Lahy and Kornhold suggest[1] that accident proneness may be detected by tests of emotional stability more accurately than by any other measure, and that in their experience, whenever a suddenly imposed and time-limited task is given to the accident-prone worker, there is a disturbance of his emotional balance and a consequent prevention of adequate sensorimotor responses.

The specific situations that may disturb the worker and upset his emotional balance have been the subject of repeated studies by Hersey,[2] who, from a 7 years' study of accident cases in Germany and America, gives first place to low physical and emotional vigor as a causative factor in accidents. Out of 400 accidents that were clinically studied, "more than half took place when the worker was in a worried, apprehensive or some other low emotional state." He diagnoses the most important causes of these low emotional states as

a. Plant worries. Often they are of an imaginary type, such as ill treatment from fellow workers or foremen, and at other times they are based on fears of any kind—fears of discharge, of demotion, of accident, or of any mishap in any of the worker's relationships with other people.

b. Home difficulties. These may be of a minor or a major type; sometimes they are due to embarrassing situations into which the children get or may get; at other times they may be due to attitudes of the wife and demands from her; at others, to criticisms from family or neighbors; and at others, to unsolved problems in the man's relations with other members of his family. Myers reports one case in which the home situation was the only accountable cause of accidents; one girl, in a group of factory workers, had more accidents than any other worker, despite adequate ability. The only factor in which she differed from coworkers to any appreciable extent was the fact that she was ill-treated at home, constantly subdued, and when she was at work she exercised her freedom privileges and took an unusual number of chances.

c. Fatigue and loss of sleep, in which a vicious circle was maintained, both of them being induced by worry and at the same time accentuated because of it.

d. Periodic emotional disturbances, which accompany over 40 per cent of the accidents. In this connection Hersey says, "Fluctuations of emotional tone from

[1] LAHY, J. M., and S. KORNHOLD, Recherches expérimentales sur les causes psychologiques des accidents du travail, Conservatoire National des Arts et Métiers, 73 pp., Paris, 1936.

[2] HERSEY, REXFORD B., Emotional Factors in Accidents, *Personnel Jour.*, 15: 59–65, 1936.

day to day and at different hours of the day, and sometimes for five or six weeks at one time, are correlated highly with accident frequency; extremes of either depression or elation correlate with accident occurrence, the depressed state resulting in lowered competency, and the elated state in less carefulness."[1]

The discovery and treatment of those workers who are easily unbalanced emotionally will be discussed in the next section of this chapter and in the chapter on The Problem Employee.

3. Physical Condition.—Repeated surveys have shown that in those situations that place an undue physical strain on the worker or on any part of the person the presence of physical weaknesses accentuates his accident susceptibility. Even when they are of a mild type, such as headache, cold, sore throat, indigestion, faintness, and even toothache, there is a high relation between accident frequency and their presence. Newbold found a relationship between these minor ailments and accident frequency that is indicated in Fig. 29.[2]

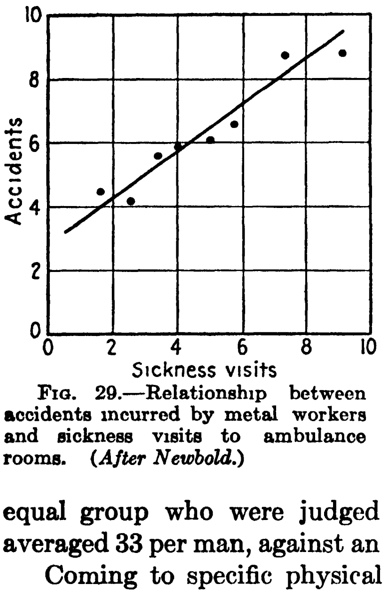


FIG. 29.—Relationship between accidents incurred by metal workers and sickness visits to ambulance rooms. (*After Newbold.*)

In a study of operators employed by the Philadelphia Electric Company, made by Viteles, the lost-time accidents for a 10-year period of 57 men with physical defects were compared with an equal group who were judged to be physically fit. The unfit group averaged 33 per man, against an average of 11 per man for the fit group.

Coming to specific physical conditions that are related to accident proneness, there is more proof of an association between accident frequency and abnormal blood pressure than any other state. Bingham and Slocombe give representative results.[3] The following table gives the results from one study. From Table 101 it will be seen that the

TABLE 101.—ACCIDENTS IN RELATION TO BLOOD PRESSURE

Men over fifty years of age	Number	Total accidents	Average per man
With high blood pressure	21	136	6½
With normal blood pressure	38	110	3

[1] *Ibid.*, p. 63.

[2] NEWBOLD, E. M., A Contribution to the Study of the Human Factor in the Causation of Accidents, *Industrial Fatigue Research Board Report* 34, 1919.

[3] BINGHAM, W. V. D., and C. S. SLOCOMBE, Individual Differences in Industrial Personnel, *Eugenics News*, Vol. 15, 1930, and *Personnel Jour.*, 6: 7 and 25, 1926.

high-blood-pressure group averaged twice as many accidents per man as the normal group.

Other physical defects that have at times shown a close relation to accident frequency are vertigo, cardiac maladies, deafness, visual defects, and hernia.

4. The Use of Alcohol.—The increase in accident liability because of the use of alcohol has been recognized for some time. As far back as 1906, the Sickness Insurance Fund of Leipzig collected data for the years 1887 to 1905 regarding the accident frequency of its 39,793 members, and compared the records of the abstainers and the chronic drinkers. The record of 564 chronic drinkers was compared with that of all the members in the fund. Table 102 gives the results.[1]

TABLE 102.—COMPARISON OF ACCIDENT RECORD OF CHRONIC DRINKERS AND OTHERS

Duration of disability resulting from accident	Accidents per 1,000 members per year		Days of sickness per year from accidents	
	All members	Chronics	Members	Chronics
Less than four weeks	32	86	.39	1.08
More than four weeks	12	37	.55	1.79
Total	44	123	.94	2.87

As will be seen from this table, the chronic drinker had nearly three times as many accidents as the average of the whole group, and lost more than three times as many days in recovering from the accident.

Another study made by Vernon in a fuse factory[2] showed a rapid rise in the number of cuts that were treated in the ambulance rooms on

TABLE 103.—AVERAGE NUMBER OF ACCIDENT TREATMENTS PER DAY
(After Vernon)

Day of the week	Average number of accidents	
	Men	Women
Monday	122	155
Tuesday	108	106
Wednesday	110	95
Thursday	88	98
Friday	84	85
Saturday	112	121

[1] VERNON, *op. cit.*, p. 70.

[2] VERNON, H. M., *Memo.* No. 21, Health of Munition Workers Committee, p. 24, 1918.

Mondays and Saturdays, a rise that could be explained only by the week-end habit of indulgence, which began with the Friday afternoon pay-off. Table 103 gives the average number of treatments per day for men and women for a 3-year period, 1915 to 1917.

The particular effects of alcohol on the organism that make for its susceptibility to accidents do not lie within the scope of this text. The effect that alcohol has on one function, speed of reaction, recognized by all workers as one of the most important functions in factory operations, is indicated in one study made by Dodge and Benedict.[1] A study was made of the average reaction time of subjects in a normal state, and that was compared with the reaction time of the same subjects when under the influence of alcohol. Table 104 gives the percentage of changes recorded when the subjects were under alcoholic influence.

TABLE 104.—PERCENTAGE CHANGES IN REACTION TIME WHEN UNDER THE INFLUENCE OF ALCOHOL

Type of performance	Per cent increase	Per cent decrease
Knee jerk	10 (time)	46 (extent)
Eye reaction	5 (time)	
Eyelid reflex	7 (time)	19 (extent)
Sensitivity to electric shock		14
Rate of tapping		9
Eye coordination		11

The significant fact about these results is the increased rapidity of reaction time, even under the influence of moderate quantities of alcohol, and the general state of "hurry" that the increase indicates, together with decreased coordination and a consequent decreased capacity for making accurate muscular responses. The effects of alcohol on judgment, powers of concentration, capacity for multiple or single attention, and accuracy of observations have been shown in numbers of other studies.[2]

5. Attitude toward the Organization.—Surveys indicate that the accident-prone worker tends to be insubordinate, critical of supervision, and inattentive to regulations. Bingham reports[3] that 39 per cent of the high-rate accident drivers of the Boston Elevated Railway showed

[1] DODGE, R., and F. G. BENEDICT, The Psychological Effects of Alcohol, *Carnegie Institute of Publications*, No. 232, 1915.

[2] See MYERSON, A., *Social Psychology*, pp. 235–238, Prentice-Hall, Inc., New York, 1935; and STARCH, D., and others, *Controlling Human Behavior*, pp. 224–228, The Macmillan Company, New York, 1936.

[3] See BINGHAM, W. V. D., The Accident-prone Driver, *The Human Factor*, 6: 158, 1932.

marked uncooperative behavior. The Cleveland Railway study revealed that among the 50 drivers with the worst accident record, 18 per cent were impulsive and irresponsible, and 14 per cent showed a poor attitude toward company regulations.

The importance of proper attitude toward one's work, as a condition of complete cooperation, is recognized now as of equal importance with the acquisition of adequate skills and effective motivating forces. The three entities—skills, motives, and attitudes—are the most important forces that make for success in any undertaking. Indifferent attitude toward an undertaking expresses itself in decreased effort and boredom; antagonistic attitude toward the same undertaking results in obstructionism; complete absorption in any task has as one of its prerequisites a favorable attitude toward, not only the immediate demands of the task, but the whole setting in which the task is placed. The absence of that attitude expresses itself in ease of irritation, ready complaints, and constant criticism and, because of the ready distractibility of the person, makes him a victim of accident whenever anything unusual happens in the work situation.

DISCOVERING THE ACCIDENT-PRONE PERSON

The methods for discovering those who are likely to have accidents are based on one of the following three hypotheses:

a. *Simple Chance Distribution, i.e.*, the assumption that in any group of people the frequency of accident occurrence will be determined by chance and will be distributed among them according to laws of the normal curve, with a very small group having either no accidents or a great number, a larger group having a few or a great many accidents, and a large middle group having the average number of accidents. This hypothesis assumes that the position in the frequency scale that any person holds is determined by pure chance, as it is due to factors beyond his control.

b. *Biased Distribution, i.e.*, the assumption that, although at the beginning of any type of work all people are equally liable to accidents, anyone who has had an accident is thereafter more susceptible than are other workers; the occurrence of one accident predisposes him to others. On the other hand, some assume that anyone who has had one accident will benefit by his experience, be more careful thereafter, and therefore not be so susceptible to future accidents as those who have had none.

c. *Distribution of Unequal Liabilities*, assuming that not all people start on an equal basis; some are inherently more liable to accidents than others. The frequency of accidents in any organization will depend upon the number of accident-prone workers in it.

These hypotheses have been tested by a number of workers in different types of situations. Greenwood and Newbold made a number of studies of the frequency with which accidents would occur in organizations according to each of these hypotheses and the frequency with which they did occur. Table 105 gives the frequency of accidents among women workers in a shell factory for a 5-week period, in 1918, and the frequency

with which accidents should have occurred according to each of the hypotheses.[1]

It is evident that the second and third hypotheses approximate actual occurrences more closely than does the first. Results such as these are what lend support to the thesis that those who have had accidents are more likely to have others than those who have had none, and that there are some people who are predetermined to accidents, unless preventive measures are taken either to remove the tendency or to remove these workers from possible danger zones.

TABLE 105.—PROBABLE AND ACTUAL FREQUENCY OF ACCIDENTS
(After Greenwood)

Frequency of accident	Number of people with that frequency	Number who should have had accidents according to hypotheses		
		a. S.D.	b. B.D.	c. U.D.
0	447	406	452	442
1	182	189	117	140
2	42	45	56	45
3	21	7	18	14
4	3	1	4	5
5	1	1	2	2

The problem that interests both employer and employee is the discovery of the human factors that make accidents nearly inevitable, the detection of those people who possess these tendencies, and the development of procedures that will help to eliminate them from among present workers and to detect them among prospective employees.

METHODS OF DETECTION

Methods of detection have been suggested by a number of experimenters. Among the many tools that have been suggested, the following have shown some degree of reliability in some situations.

I. Experience Record.—This need not necessarily be limited to accident record; other variables that are associated with that are equally significant. Granniss has shown[2] that the accident prone are more likely to make errors in their work, to have poorer attendance records, and to react more slowly and unwillingly to supervision than does the average employee in the organization. There is no adequate proof that because a

[1] NEWBOLD, *op. cit.;* GREENWOOD, M., and H. M. WOOD, The Incidence of Industrial Accidents, *Industrial Fatigue Research Board Report* 4, p. 25, 1919.

[2] GRANNISS, E. R., Mental Hygiene as Applied to Industrial Accident Prevention, *Mental Hygiene,* 19: 398–404, 1935.

person has had one accident he is therefore accident prone, but there is convincing proof that the greater the percentage of people who have accidents, the larger will be the number of accidents per person.[1]

II. Mental Level.—The results of taking intelligence test scores as indicators of accident probability are of questionable value. In some studies there is a positive relation between the score on the test and accident frequency, and in others there is an inverse relation or no relationship. Farmer, in his extensive studies, found no consistent relation between the two, but other investigators have found a close relation between low scores and accident frequency.

Henig reports[2] a higher accident frequency among low-grade students than among high-grade ones in a vocational school. Based on Army Alpha scores, all the C and D group boys received some injury during a 2-year course, whereas only one-half of the A group and one-third of the B group had any accident. Mls[3] gave the Army Beta to 749 men who were taking courses in driving as part of their military training at Prague, and reports that those with an I.Q. below 82 were the victims of so many accidents that they were not recommended as drivers. On the other hand, those who made a score above 94 were no better than the average group, 82–94. Those scoring above 115 were distinctly superior to the rest of the group. In a study of 346 motormen at Prague, Vano[4] found that 16 per cent of the conductors made a score of 60 or less on the Army Beta, and the same percentage were responsible for 51 per cent of the accidents.

In spite of these occasionally reported relationships, there is no valid proof that intelligence tests can be used to foretell accident proneness; low intelligence may be a contributory factor, especially as it usually accompanies inaccuracy in both observation and judgment, but there are other factors in the total situation that are of greater importance than low intelligence.

III. Tests of Coordination of Muscular Movements and Sense Stimuli.—This type of test has shown more constant and frequent relation with accident proneness than has any other type. Farmer[5] has used

[1] NEWBOLD, *op. cit.*, pp. 25–26.

[2] HENIG, M. S., Intelligence and Safety, *Journal of Educational Research*, 16: 81–87, 1926.

[3] MLS, J., Intelligenz und Fähigkeit zum Kraftwagenlenken, *C.R.*8 *Conf. int. Psychotech.*, pp. 274–284, 1935.

[4] VANO, J., Les Résultats des recherches sur la susceptibilité aux accidents chez les conducteurs de tramways de la Ville de Prague, *C.R.*8 *Conf. int. Psychotech.*, pp. 293–302, 1935.

[5] FARMER, E., E. G. CHAMBERS, and F. J. KIRK, Tests for Accident Proneness, *Industrial Health Research Board Report* 68, 1933. See also *Personnel Jour.*, 9: 115–120, 1930–1931.

some such tests with shipwrights, electric fitters, and engine fitters, and reports that "poor aesthetokinetic coordination, *i.e.*, the inability to do certain sensorimotor tests, is associated with a liability to sustain an undue number of accidents." When the results from intelligence tests and aesthetokinetic tests were combined and weighted in terms of their relation to accident frequency, the accident rate of the lowest 25 per cent was two and one-half times greater than that of the remaining 75 per cent. This does not, however, imply that poor aesthetokinetic coordination is associated with accident proneness in all occupations; deficiency in this function is contributory to the factors responsible for accidents only in types of work in which there is a demand on that particular capacity.

Tests for evaluating one's capacity for making proper muscular adjustments are numerous. Among the most successful are the following:

A. The Dotting Test.—In this the subject places a dot in each of a series of small circles, which pass before him at varying speeds; the accuracy of his placement is an indication of the speed with which he adjusts himself to various situations in which speed is the chief factor.

B. The Pursuit Meter Test.—In this test the subject follows the oscillations of a needle with a pointer. The needle oscillates at a different rate every 5 seconds, and the test lasts 5 minutes. The accuracy of the pursuit is indicated by the number of errors made in each 5-second interval.

C. The Test for Reaction Time.—In this the subject presses a key or gives a signal when certain stimuli are seen or heard. The most recent use of this type of test in work situations is in the form used by the Harvard Traffic Bureau, in which the reaction-time testing apparatus consists of the steering and braking equipment of a standard car, attached to "stop" and "go" signals, and a timing device graduated in hundredths of seconds. One clock indicates the accelerator reaction time between the appearance of the red signal and the instant when the operator lifts his foot from the accelerator; the other clock measures the braking reaction time between the appearance of the red light and the instant when the operator applies the brakes; the difference between the two time intervals gives the foot-movement time. This test has been used in a number of cities and with thousands of subjects, in each case a comparison being made between the reaction time of high-accident-record motor drivers and volunteers. The results from a number of studies are given in Table 106.[1]

The significance of these small differences is apparent when it is noted that if a person has a brake reaction time of 0.48 second and is traveling at

[1] I am indebted to Dr. Harry de Silva for the data in this table; they are taken from studies made in 1937 under his direction at the Harvard Traffic Bureau centers.

50 miles per hour, the car will move 35.2 feet before it can be stopped, whereas if the reaction time is 0.42 second the car will move only 30.8 feet.

D. Tests of Visual Coordination.—Numbers of tests of this type have been developed and used with success, those in use in traffic bureau

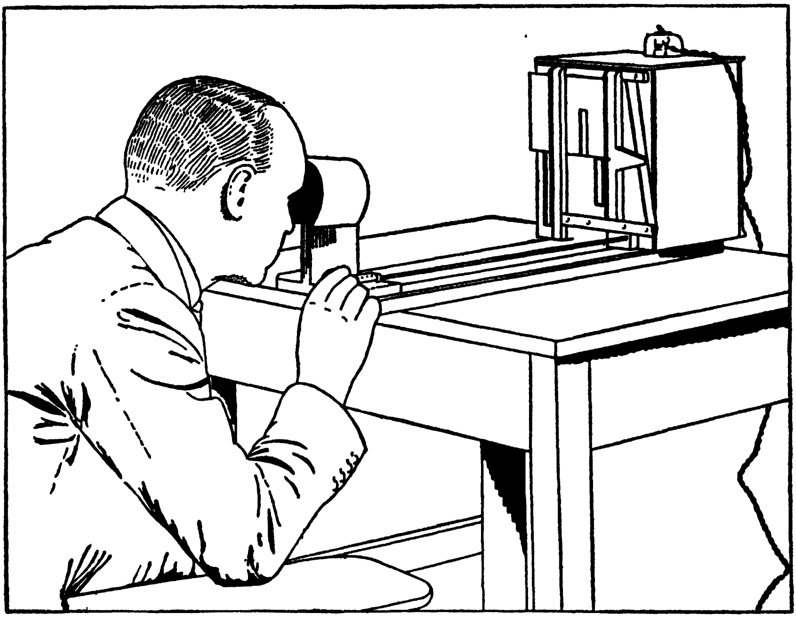


FIG. 30.—Test for the coordination of eye muscles. (*Courtesy of Dr. C. S. Myers.*)

laboratories and experimental stations being among the latest and most reliable. Figure 30 illustrates one that has been in use at the National Institute of Industrial Psychology for years.

TABLE 106.—REACTION TIME OF REPEATERS AND VOLUNTEERS

Cities	Accelerator reaction time, in seconds		Brake reaction time in seconds	
	Volunteers	Repeaters	Volunteers	Repeaters
New York City	.187	.203	.422	.455
Concord, N. H	.208	.248	.431	.488
Manchester, N. H	.205	.217	.438	.446
Vermont (4 cities)	.204	.217	.456	.497

In this test a hood is placed over the subject's head and he is asked to look through a modified binocular device at two illuminated strips, which can be adjusted by a knob at the subject's wrist. The device is so arranged that the subject sees each strip with one eye only; while

looking at both strips he is asked to turn the knob until both are in the same vertical plane; if the coordination of the various muscles controlling the eye is not perfect, he will see the strips in line when they are actually separated by distances varying from 0.1 inch to 2 or 3 inches.

Another coordination test that has shown consistent and valid discriminations is that developed by Dr. de Silva of the Harvard Traffic Bureau, illustrated in Fig. 31.

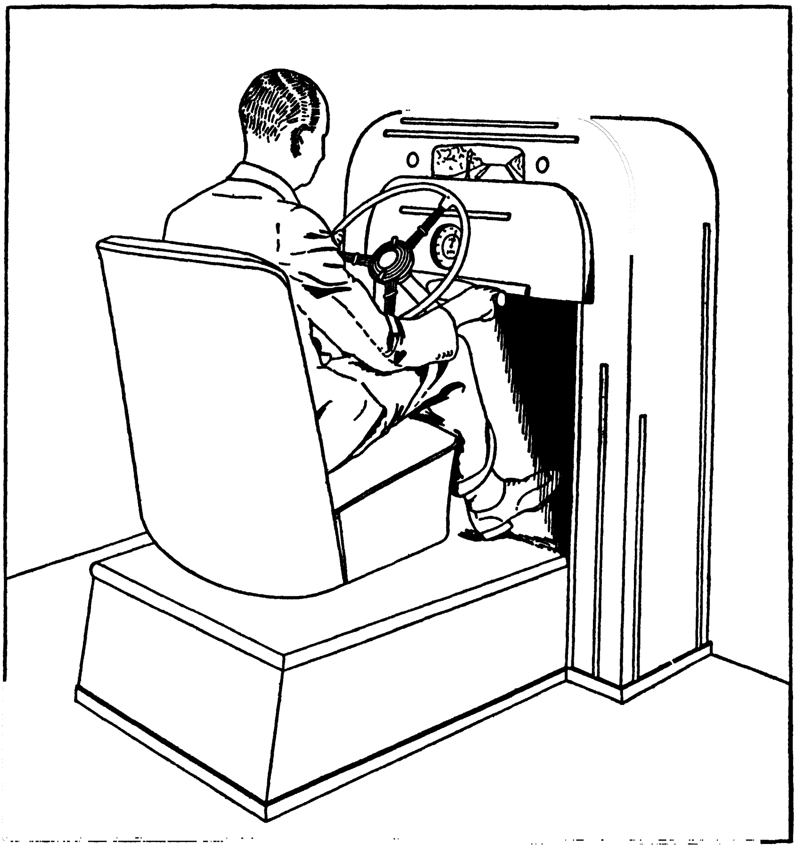


FIG. 31.—Braking reaction, steering coordination, and vigilance test. (*Courtesy of Dr. H. de Silva, Harvard Traffic Bureau.*)

In this test the subject is placed in the driver's seat, and in place of the windshield there is some scenery, which moves forward at varying speeds and creates the illusion of driving along a highway. The subject is instructed to keep the car in the right lane of the roadway; whenever he gets off to the right of the correct pathway, a light signal on the right appears, and when he gets off to the left of the correct pathway, a signal on the left appears. The scenery moves before his field of vision at

varying speeds, determined by the force he applies to the accelerator, and the score is determined by the number of times he fails to keep the car in the right pathway. Table 107 shows the contrast between volunteer and accident-repeater motorists, the percentages representing the amount of time that each group was successful in remaining in the critical zone. The consistency with which "volunteers" surpass "repeaters" would seem to indicate that slowness of reaction time is one of the major factors responsible for accident frequency among motorists.

TABLE 107.—DRIVING ACCURACY OF VOLUNTEERS AND REPEATERS
Per Cent

Drivers	New York	Concord, N. H.	Manchester, N. H.	Vermont
Volunteers	52.8	62.77	64.92	61.5
Repeaters	47.7	54.60	58.29	52.4

E. Tests of Visual Perception.—Such tests have formed a part of testing equipment in industry for some time; the standard distance test used by optometrists, with a distance chart normally placed 20 feet from the subject's eyes, forms part of the necessary equipment of many employment offices. A near-distance test, using a smaller chart placed at a distance from the person which equals the working distance of the job, is common in many industrial employment offices. For other perceptual factors the most recent developments have been made by those who are experimenting with the motor-hazard problem; of these the most satisfactory results have been secured from tests devised by the National Institute of Industrial Psychology, London, and by Dr. de Silva of the Harvard and Yale Traffic Bureaus. The following factors have been tested with various kinds of apparatus.

1. Glare Blindness (see Fig. 32). A test for this capacity has been devised by Dr. de Silva; in it a night-driving situation is represented in which glaring headlights shine into the testee's eyes as he steers a car over a represented highway. On the right-hand side of the roadway there is an illuminated pedestrian. With the intensity of the headlight kept constant, the illumination of the pedestrian is gradually decreased until the point is reached at which the driver can no longer see him. The intensity of the illumination gives an index of the testee's glare sensitivity.

2. Glare Recovery. Under the same conditions as for glare blindness, a strong light shines into the testee's eyes for a few seconds. The time that is necessary to allow the subject to see the highway clearly again, after the light is switched off, is an index of his speed of recovery.

3. Depth Perception. This is a test of one's ability to estimate how far away he is from an approaching object.

4. Peripheral Vision. While the testee looks straight ahead at his image in a mirror, the examiner moves a light box out from the center along a curved rod until the subject can no longer see it. The angle at which the light disappears from view on both sides gives a measure of his field of vision.

5. Binocular Coordination. Tests similar to that represented in Fig. 30, but testing lateral as well as vertical capacity, are used.

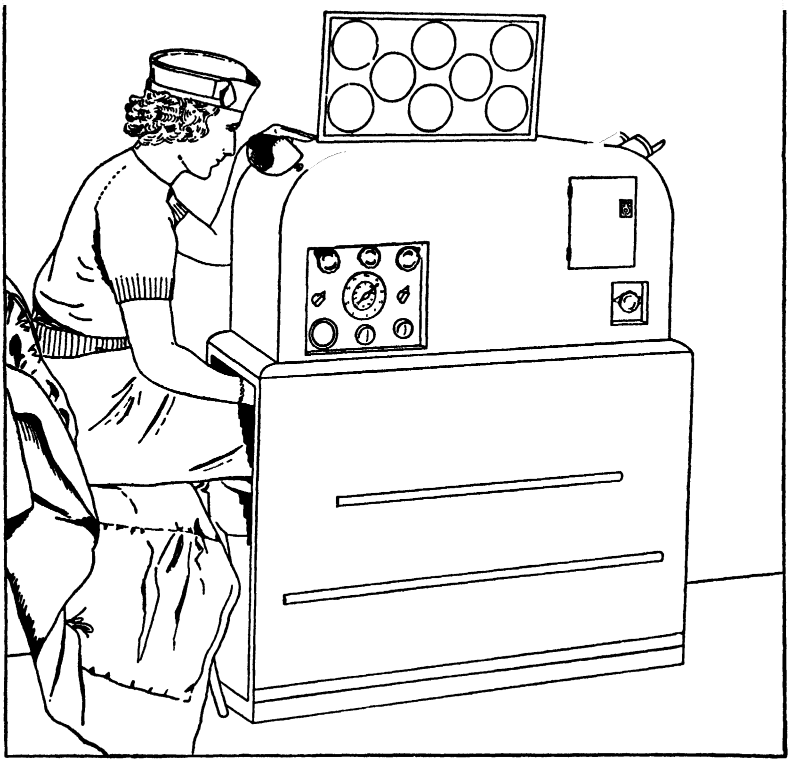


FIG. 32.—Perception test for depth perception, tunnel vision, glare blindness and recovery, and binocular coordination. *(Courtesy of Dr. H. de Silva, Harvard Traffic Bureau.)*

6. Estimation of Speed. The Harvard Bureau Test is similar to that developed by the N.I.I.P. and is illustrated in Fig. 33.

It consists of a track about 8 feet in length, and two blocks, representing cars, which move at different rates or start at different times and travel along the track in either the same or opposite directions until they overtake each other. The point where they overtake each other and adjacent parts of the track are concealed by a screen, and the testee is asked to estimate the point at which the blocks meet. A number of

trials are made, with different speeds and starting points. The blocks may move in the same or in opposite directions. The subject watches the moving blocks for a short time, and records the number that represents the position, behind the screen, at which he thinks one will overtake the other.

7. Astigmatism. The usual tests made by an optometrist are effective for this condition.

8. Color Vision. The red, yellow, and green lenses of the regulation traffic lights are used to measure defective vision for colors. The colors

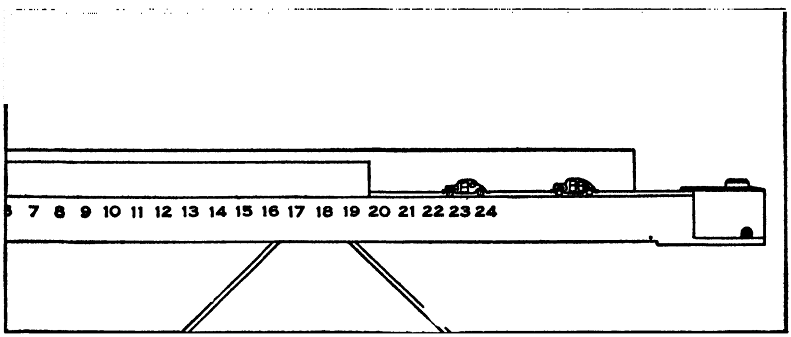


FIG. 33.—Test for judgment of speed. (*Courtesy of Dr. C. S. Myers, The National Institute of Industrial Psychology, London, England.*)

are presented in miscellaneous order, in the same position, and the subject is asked to name each color as it appears.

The differences in the scores made by repeaters and volunteers in some of these tests are indicated by the average scores from testees in two cities in which the tests were given. The differences in the average

TABLE 108.—"REPEATERS" VERSUS "VOLUNTEERS" IN MOTOR TESTS

City	Drivers	Glare[1] blindness	Speed[2] estimation	Binocular coordination, per cent	Peripheral vision, per cent	
					Left	Right
Concord,	Volunteers	7.13	2.85	90.20	99.75	98.75
N. H.	Repeaters	5.60	3.23	87.50	92.75	94.25
Manchester,	Volunteers	6.71	2.45	85.55	97.80	97.95
N. H.	Repeaters	6.81	2.11	81.58	94.53	95.68

[1] High score indicates better vision.

[2] The score is the sum total of errors, averaged; low score indicates better vision.

scores on all the tests, with the one exception of glare blindness in one city, would seem to indicate that physical and mental defects are among the prime causes of accidents.

Very rarely does it happen that weakness in all these tests is found in any one person; quite often a person with weakness in one test will show superior ability in others; and in many cases a person will show average ability, or better, in all the tests and yet have a high accident record. Dr. Mizzi tested 3,500 bus drivers and motorcar operators in Prague,[1] and found no relation between diffusion of attention, speed of perception, and ability to judge speed and distance, or between all three tests and accident record. He suggests that other factors, especially a sense of space and time, may be more closely related to ability to judge distance and speed than are the factors measured by such tests.

IV. Tests of Emotion.—The frequent failure of tests of coordination and perception has led to the suggestion that accident proneness may be

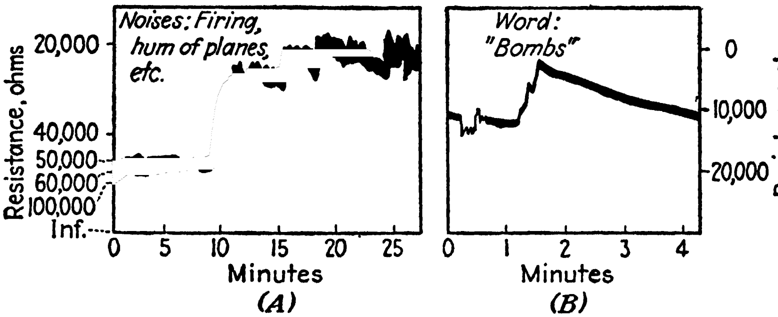


FIG. 34.—Galvanic deflections under emotional situations. (*After Waller.*)

due to emotional instability, and that the tendency may be detected by tests for such an incapacity. Tests of this kind abound; some are of the paper-and-pencil type, and some are of the laboratory type. Among the many that are used, the *psychogalvanometer* has occasionally given surprising results. In 1888 it was discovered that when electrodes are placed on the skin and attached to proper electrical measuring instruments, variations in the electrical properties of the skin will appear from time to time, and when the subject is in a state of excitement these variations are greater than usual. Since that discovery, numerous experiments have shown that the magnitude of the deflection of the galvanometer is determined by the sensitivity of the instrument, its resistance, the amount of electrical force applied to the bridge of the galvanometer, the intensity of the emotion that is experienced when the subject is "in the circuit," and the part of that emotion which finds expression through those efferent channels that innervate the skin mechanisms. An illustration of the effect of emotional experiences

[1] MIZZI, A., Beziehung zwischen diffuser Aufmerksamkeit, Wahrnehmungschnelligkeit, und Schätzung der Geschwindigkeit und Entfernung, *C.R.8 Conf. int. Psychotech.*, pp. 262–277, 1935.

on galvanic deflections is given in Fig. 34. Part *A* records the changes in resistance of a subject during an air raid over London by an enemy plane. Beginning at the tenth minute of the observations and continuing for 20 minutes, the noise of airplanes and gunfire was heard; during that period there was a lowering of the testee's resistance by over 30,000 ohms. Part *B* gives a record of the same subject later, when the word "bombs" was given him as a stimulus.[1]

The same type of test has been used to test individual proneness to accidents in industries; the speed, frequency, and amount of change of resistance under various kinds of emotional situations have correlated highly with accident proneness. Welch reports[2] that, in one of his studies, the subjects who showed an above-average frequency of change of resistance had an accident rate 67 per cent higher than those who showed less than the average number of changes. Farmer reports,[3] "those who had a low resistance to an electric current tended to have more than the average number of accidents."

Bonaventura thinks that accident susceptibility may be tested by emotional tests in preference to ability tests. Claiming that many accidents are due to muscular disturbance caused either by a short emotional shock or by prolonged annoying and distracting situations, he suggests[4] that a test should be given to measure one's capacity to inhibit those muscular reactions that might interfere with the proper performance of a task, when there is an exciting or disturbing situation present. The type of test that he suggests is one involving sensorimotor coordinations (*e.g.*, the pursuit meter or the dotting tests) concurrently with intermittent emotional stimuli.

Inadequacy of Tests

Accidents are rarely caused by any one deficiency in the operator. Various factors contribute to general inadequacy: age, experience, training, attitudes, physical condition, fatigability, capacity for persistence, emotional balance, etc. An appreciation of the significance of these factors cannot be gained from any one index, regardless of its validity in evaluating the adequacy of any one function. Accident-producing behavior, in the majority of cases, is the result of a complex of inabilities, distracting interests, experience, motives, and temporarily

[1] Waller, A. D., The Galvanometric Measurement of Human Emotion, *Nature*, 107: 183–186, 1921.

[2] Welch and Miles, *op. cit.*, pp. 143–144.

[3] Farmer, E., The Study of Personal Differences in Accident Liability, *Jour. Nat. Inst. Industrial Psychol.*, 3: 432–437, 1926–1927.

[4] Bonaventura, E., L'Examen de l'émotivité dans la sélection des conducteurs des véhicules rapides, *C.R.8 Conf. int. Psychotech.*, pp. 225–229, 1935.

disturbing emotional situations, the significance of which can be gained only when the personality as a whole is studied and an understanding is made of the basic impulses that may be finding expression in distorted ways, of the environmental situations either near at hand or in the ideational field of the particular person, and of the conscious inadequacies that he may be attempting to conceal or atone for by unusual forms of behavior.

It is the recognition of the importance of these factors that has led to the adoption of *the clinical method* in diagnosing each case, instead of the statistical method, which characterized studies in the past and which has resulted in adequate grouping of causes and percentages, but has given no attention to the "individual-particular situation" entity, the nature of which must be understood before adequate disposal of the case is made. The necessity of this is realized even when there is a set of testing equipment as elaborate as that used by the Harvard Traffic Bureau. Dr. de Silva says, "the reason for the existence of a driver clinic is to give the adult confidential advice of an objective nature on what is wrong with his driving and what should be done about it . . . a driver clinic, like a medical clinic, aims to examine, diagnose and treat persons who have something wrong with them."[1]

ACCIDENT PREVENTION

The axiom "prevention is better than cure" is true in industry in many respects. From an economic standpoint, "the largest single item of waste in industry today is the cost of injuries," and if for no other reason than that of reducing expenses, preventive measures must be introduced. From the standpoint of morale and public esteem, an organization must be regarded as a safe place to work, if it is to court public favor. From the point of view of humanitarian principles, the day when one person was at liberty to ask others to undertake risks in the interests of his enterprise is past; management is under obligation, not only to protect its ledger, but also to protect those who are a vital part of its system. Industry has recognized this for some time and, either on its own initiative or spurred on by legislation and national organizations, it has undertaken nearly every conceivable measure to protect those for whose welfare it is responsible.

The extent to which preventive measures are being carried on is indicated in a survey recently completed by the National Industrial Conference Board[2] and summarized in Table 109.

[1] From an unpublished report which Dr. de Silva has permitted me to use.

[2] WALTERS, J. E., Effect of the Depression on Industrial Relations Programs, *Report* 209 *of the N.I.C.B.*, 1934.

A later report from the same source[1] states that organized accident prevention is almost as prevalent in nonmanufacturing as in manufacturing establishments.

TABLE 109.—SAFETY WORK IN 233 INDUSTRIES, IN PER CENT
(After N.I.C.B.)

Activities carried on	Now	Dropped because of		Adopted lately	Considering adoption
		Depression	N.I.R.A.		
Mechanical safeguards	92 3	.5	0	0	0
Safety education	75.1	.6	0	0	.6
Safety conferences	68.7	3.8	0	.6	0
Safety posters	88.8	1.4	0	.5	0
Safety competition	42.5	6.1	0	1.0	0
Safety committees	74.2	3.5	0	.6	0

ORGANIZED MEASURES

Accident-prevention measures have been undertaken through both national institutions and local organizations. Among the national institutions that have been actively waging an effective campaign are those discussed below.

The National Sáfety Council.—Industries began taking an active part in safety prevention in 1907, and by 1912 a number of companies felt that the problems they were facing had sufficient in common to justify pooling their information and disseminating the techniques that they had found to be useful; the result was the formation of the N.S.C. Since then the organization has shown an annual increase in membership, until today it has nearly 4,500 members and includes the majority of the large organizations in the United States.

As a distributing center, it serves as a clearinghouse for the latest information. It issues a weekly bulletin describing the most effective plans and methods being used, a ceaseless series of suggestions for safety posters (distributing three posters weekly), a monthly pamphlet containing engineering studies of industrial hazards, sectional bulletins for particular industries, safety motion-picture films, and stereopticon slides for group meetings. In addition, it maintains an information bureau and a library, from which the latest data on any phase of safety work are available.

Accident Compensation Laws.—These have been introduced in nearly all the states in the Union. They compel the employer to pay definite amounts to those who receive injuries in the plant. The usual

[1] See *Report* 221 *of the N.I.C.B.*, 1936.

provisions are that the employer must provide for proper medical attention and pay a certain proportion of the workman's wages during the lost time, or for a definite period, unless the accident has been caused by deliberate disobedience of rules, and even then a portion of the indemnity must be paid. The result has been an increased interest in safety rules and in discovering those who are accident prone.

It is through the payment of compensation that the cost of work injuries is brought home to the employer. A high accident rate means a high insurance rate. . . . One of the principal objects of compensation legislation is to stimulate interest in the prevention of accidents, and such laws have given everywhere a notable impetus to the safety movement. . . . The prevention of accidents is the only effective method of reducing the burden which the compensation system imposes.[1]

Additional Organizations.—Besides the two national institutions just considered, there are such organizations as *The National Committee on Safety*, organized in 1926 under the U. S. Department of Labor and acting as a clearinghouse for accident statistics, which are reported monthly or annually for each major industry; *Casualty Insurance* companies, some of which maintain a force of engineers and inspectors who travel throughout the country introducing and installing improved safety methods, coaching employers in their use, and conducting researches in methods of eliminating causes of accidents; the *Policyholders' Service Bureau* of the Metropolitan Life Insurance Company, which maintains a staff of safety engineers who are constantly studying the accident problems of group policyholder plants, making safety inspections, recommending safety programs, and planning educational activities; and the *American Engineering Standards Committee*, which already has formulated special national safety codes for 50 types of hazard, and has introduced them in industries where the hazards exist. Supplementing these organizations there are industrial collective bargaining safety plans, in which provision is made to prevent injury to life and limbs, as well as ill-health, that may be caused by working conditions. For example, the barbers' code includes, "I agree to keep my shop not less than 65°F. temperature in cold weather; I also agree to keep my shop well ventilated and freed from flies, either by screens or by the use of electric fans."

Local Safety Work

Mass treatment of accidents can provide organizations only with general statements, broadside remedies, and "shotgun prescriptions"; these must be supplemented by individual diagnosis of each accident

[1] Bossard, J. H. S., *Problems of Social Well Being*, p. 420, Harper & Brothers, New York, 1927.

situation and the application of remedies and preventive measures that will meet the demands of each occurrence.

The key person in any organization responsible for enlisting management support and developing safety consciousness on the part of the workers is the safety engineer. Through constant inspection of unsafe practices, by spotting locations where safeguards are needed or where unsanitary conditions exist, he can make specific recommendations to committees of both foremen and workmen with whom he is, or should be, constantly in touch. He is responsible for directing safety campaigns, for supervising bulletin-board service, for arranging safety meetings, for formulating shop safety rules and disciplining those who constantly disregard them, and for investigating all accidents, properly reporting and recording them, and introducing such measures as will prevent their recurrence.

Of equal importance with the safety director is the foreman of each department. It is he who must enlist and keep alive the interest in safety work of every worker in his department; who must help formulate safety regulations, prominently display them, constantly impress them on others, and enforce adequate and effective penalties for violation of them. He is also responsible for the proper use of the bulletin board, the display and occasionally the construction of posters, the reporting of unsafe practices, the investigation of each accident in his department, and the correction of the factors that were responsible for its occurrence; and on him rests responsibility for the instruction of each new employee in the safety rules of his department and in the observance of the cautions necessary in hazardous situations.

The tools that are used by organizations are of various kinds; among them the following are the most common.

Mechanical Safeguards.—These include the proper protection of and warning against dangerous places; adequate lighting, heating, and atmospheric conditions; adequate protective devices for eyes and limbs; adequate guards and screens; and the enforced use of protective clothing. The extent to which these safeguards are of value is indicated in a survey made by Stephenson[1] in which the estimate was made that one-third of industrial accidents were due to machinery, but that not more than one-third of these were due to the absence of proper safeguards. The usual estimate is that not more than 15 per cent of industrial accidents are due to improper mechanical safeguards.

When mechanical safeguards are used, the following cautions are necessary:

[1] STEPHENSON, A., Accidents in Industry, *Jour. Nat. Inst. Industrial Psychol.*, 2: 194–200, 1926.

a. It should not be possible to remove the safeguard from the machine.

b. The guards should be so placed that they do not hamper the worker.

c. The operators should be given adequate instruction in the use of the machine when the guard is present.

Safety Committees.—These are usually composed of the safety engineer and representatives of management and employees, with various workers' committees in the different departments.

The general committee is usually responsible for introducing new safety techniques and for arousing interest among all employees in safety practices. The tools that are used vary. Those most commonly found are *safety signs*, which call attention to specific dangers, list unsafe practices, and display slogans; *bulletin boards*, for posting material of general interest, giving items of educational value, and displaying the safety and health bulletins that are received from national organizations; and *mass meetings*, in the plant or in cooperation with community safety projects, in which safety plans and talks are interspersed with other matters of general interest.

The subcommittees are responsible for inspecting, with the cooperation of the foremen, all hazardous situations, investigating all department accidents, and reporting them either to the general committee or to the safety engineer. They are usually called plant safety committees, and are composed of a small number, either appointed by the foreman or elected by the workmen, who serve for from 3 to 6 months, and in their monthly meetings exchange preventive measures and make recommendations for special precautions in each department.

These two committees are responsible for making every member of the organization safety conscious; the most frequently used tools are intercompetition between departments for clean records, or competition with neighboring industries, safety-first campaigns, safety-instruction programs, and safety conferences. The one tool most commonly used is the *safety poster*. These posters are of all types; a common practice and belief is that the more gruesome the poster, the more effective it will be; and the result is the display of posters on which a blood-dripping hand is shown with two fingers missing, or in which a woman is wailing because her hand has just been pierced by a drill, or in which a man is about to be crushed by a falling girder. Posters of such a type may be effective among the small percentage of callous persons who have to be controlled by fears; but in the majority of workers, the display of posters of this kind intensifies timidity, anxiety, and nervousness, rendering them more susceptible to accidents than they otherwise would be. For posters to be effective, the following cautions should be observed:

a. They should represent actual occurrences in the plant and show how a particular type of accident has been caused.

b. There should be very little reading matter, and it should be clear enough to attract attention, even at a casual glance.

c. They should be placed in conspicuous places, such as entrances, exits, and selected working places, and should be changed at least every 3 weeks.

d. They can be effectively used if there is in them a touch of humor, provided that they do not treat the accident situation with undue levity or vulgarity.[1]

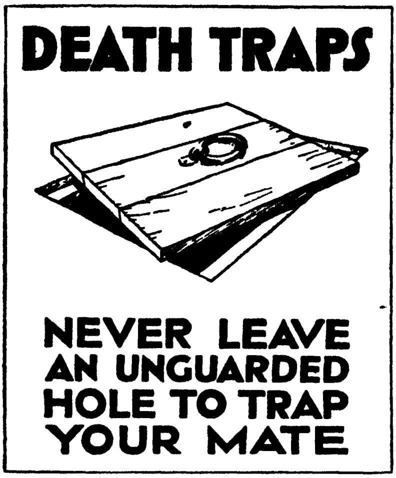




FIG. 35.—Effective posters. (*Courtesy of Welch and Miles, "Industrial Psychology in Practise," Sir Isaac Pitman & Sons, Ltd.*, 1936.)

e. Figure 35 illustrates two simple posters, which represent frequently occurring situations, and which are typical of those that can be used to good effect in any organization. The appropriateness of an illustration depends, of course, upon the frequency with which that type of experience is met in an organization.

RESULTS OF ACCIDENT-PREVENTION PROGRAMS

The results from well-organized programs can best be given in reports that have been issued by different companies.

In Table 110 can be seen the changes in accident frequency and severity rates during varying periods of time.[2]

The companies in Table 111 report the periods stated as "no-accident" periods.

Equally striking reports are given by other companies. Bingham and Slocombe report[3] a reduction in accidents in the Boston Elevated

[1] In this connection, the following article is recommended: MYERS, C. S., The Use of Gruesome and Humorous Propaganda for Accident Prevention, *The Human Factor*, 10: 267–272, 1936.

[2] Adapted from BARIDON, F. E., and E. H. LOOMIS, *Personnel Problems*, p. 252, Harper & Brothers, New York, 1921.

[3] BINGHAM, W. V. D., and C. S. SLOCOMBE, Safe Transportation, *Personnel Res. Fed. Studies*, No. 8, New York, 1930.

TABLE 110.—CHANGE IN ACCIDENT RATE IN DIFFERENT PERIODS

Industry	Year of 1st report	Rate		Year of 2d report	Per cent decrease	
		Frequency	Severity		Frequency	Severity
Iron and steel	1900	55.00	2.90	1927	73.67	55.77
Cement	1919	29.20	0.34	1927	67.17	49.28
Paper	1920	19.96	1.03	1927	40.83	39.62
Chemicals	1923	16.75	2.88	1927	27.49	60.25
Power presses	1926	4.78	0.46	1927	19.73	33.09

TABLE 111.—"NO-ACCIDENT" OR "MAN-HOURS-WITHOUT-ACCIDENT" PERIODS BY DIFFERENT COMPANIES

Year	Company	Length of time or number of man-hours without accident
1924–27	Delaware and Hudson (Colonie Shops)	3 years 1 month
1927	Kimberly Clark	172 days
1926	Green Cab (Cleveland)	3 months
1925–27	Union Carbide Company (Sault Ste. Marie)	2 years 10½ months
1932	Dupont (Old Hickory)	9,166,634 man-hours
1932	Clark Thread Company	6,792,695 man-hours
1932	Remington Typewriter	6,145,514 man-hours
1933	United Shoe Machinery	7,019,735 man-hours
1933	Corrigan, McKinney Steel	5,326,144 man-hours
1934	Pullman	4,217,311 man-hours
1934	Nebraska Power	4,101,044 man-hours
1935	Western Clock	11,114,599 man-hours
1936	Forstmann Woolen	1,207,669 man-hours

System of 27.3 per cent in 2 years, and a corresponding decrease in accident cost of $300,671 per year. The Philadelphia Electric Company reduced its lost-time accidents from 517 to 138, and the number of days lost because of accidents from 8,121 to 3,913, in 4 years.[1] R. H. Macy & Company between 1926 and 1935 reduced its total accidents from 764 per year to 149, its accident rate from one per 3,000 miles to one per 54,054 miles, its rate per 1,000 vehicle days from 10.7 to 1.8, and its insurance cost by $40,000. And because of a carefully planned accident-prevention campaign, the United States Steel Corporation has decreased its accidents 86 per cent in a 13-year period.

Evidently accident prevention pays.

[1] VITELES, MORRIS, *Industrial Psychology*, p. 330, W. W. Norton & Company, Inc., New York, 1932.

3. Try out the Bell Inventory on five people whom you regard as normal and on five whom you regard as "difficult." Compare the results.

Required Readings

1. VITELES, MORRIS: *Industrial Psychology*, pp. 586–611, W. W. Norton & Company, Inc., New York, 1932.
2. HEPNER, H. W.: *Psychology in Modern Business*, pp. 76–147, Prentice-Hall, Inc., New York, 1930.

Supplementary Readings

1. ELKIND, H. B. (ed.): *Preventive Management*, B. C. Forbes Publishing Company, New York, 1931.
2. SADLER, W. S.: *The Mind at Mischief*, Funk & Wagnalls Company, New York, 1929.
3. FISHER, V. E., and J. E. HANNA: *The Dissatisfied Worker*, The Macmillan Company, New York, 1931.

CHAPTER XV

PSYCHOLOGICAL FACTORS IN CONSUMER CONTACTS

PUBLIC GOOD WILL AND ADVERTISING

Business and industrial organizations are confronted with two types of human contacts, those that are peculiar to their own personnel structure and those that connect them with and relate them to a consuming public. The tools that have been discussed in previous chapters are largely related to internal personnel problems; those that are summarized in this chapter and the one that follows relate to external personnel contacts. These contacts are made in three ways:

1. By building up acceptable public relations and securing public good will.
2. By various forms of advertising.
3. By different selling mediums.

The psychological factors that are of greatest value in making the most effective use of two of these forms of contact are the topics with which this chapter is concerned.

PUBLIC GOOD WILL

The extent to which an organization depends upon local, and sometimes national, good will is most evident in times of crises. It is expressed most vividly in such expressions as, "That's a good place to work," "That's a good company to work for," and is most apparent when conditions of labor shortage are reflected in a dearth of applicants in some employment offices and a superfluity in others.

The factors that are responsible for the development of good public attitude may be grouped under two headings—negative, *i.e.*, the avoidance of practices that antagonize the public; and positive, *i.e.*, the carrying on of practices that are in the best interests of the public. The negative factors may be listed as follows:

a. The Location of the Plant.—The factors that determine plant location are frequently appraised in terms of their value to management; such factors as accessibility of raw material, transportation facilities for the finished product, and availability of labor supply are those most frequently considered. Of equal importance with these are such factors as conjested highways, reduced property values, increased noise, impurities that are thrown into the air and water with resulting health hazards, and the transition from the quietude of a residential district to the turmoil of a manufacturing district with the result that families are displaced, property that was once

a source of pride is converted into a cause for irritation, and a community that prided itself on its livability lives only as a memory. The net result of this lack of consideration for the interests of individuals in the community is the creation of feelings of resentment and antagonism that years of effort at gaining public good will cannot remedy.

b. The Appearance of the Plant.—The addition of a plant to a community does not merely represent the establishment of a work and production or distribution center; it represents an addition to the community, a force that will be potent in the strengthening or the undermining of community morale, and that will be a source of pride or despair to the members of the community. Two factors contribute to the attitude that the community will take toward the addition: the reputation that it acquires as a physically and morally healthy place in which to work, and the extent to which the physical structure adds to the beauty and dignity of the community.

The former—physical and moral health—has been recognized for some time as a potent force determining survival; under the watchful eye of various social service organizations, those places that are, or would readily succumb to act as, centers for sabotaging the moral and physical life of their members, and through them of the welfare of the community, are sometimes discovered and removed. They are recognized as threats to national security and to the safety of the social structure; federal and state laws ensure their removal. But, no such forces operate to determine the physical appearance of plants. Under the stimulus of the examples set by some companies, particularly the insurance companies and the banks, standards of public acceptability are gradually being built up. It is the application of these standards to all types of structures that will help to convert sources of complaint into centers of community pride.

c. Unjust or Inconsiderate Treatment.—This may be given to any employee or to any applicant for employment. Every visitor to or worker in any company is a potential public agent. Any form of ill treatment or lack of adequate consideration given to one person is reported to many others. Every assumed injustice is multiplied manifold as it is reported, and every report of misunderstandings or injustices strengthens public mistrust and suspicion. Many companies have been alert to the importance of this potential danger, and have made sure that their contact men should be such that proper consideration is assured to others. The key importance of employment managers, adjusters, and supervisors is largely due to the effect that their behavior may have on an unseen public.

d. Competition with Local Units.—The extent to which such competition may be a force that creates public ill will depends on the nature of the competition. The most common examples spring from the desire to be of value to employees and take the form of competition with local and well-intrenched community centers in the way of sales' service. Equally hazardous is the sponsorship of so-called service units that conflict with the interests of local agencies; and of parallel importance is the assumption of a paternalistic attitude toward employees that has the guise of protection against local wolves. It is true that the assumption of such an interest spells the death of the would-be shyster; it is equally true that the assumption exposes the organization to the accusation that it is usurping the functions of the church, of civic leagues, and of other organized moral and social agencies in the community.

Over against these negative forces, to be avoided, there are positive and constructive forces that will build up, or that have built up, public good will. Among those that have had greatest success the following are the most significant:

a. The production of goods of such a quality that the consumer is assured that he gets the worth of his money.

b. A reputation for fair play and for giving sincere consideration to every employee and every applicant or visitor.

c. Company sponsorship of, and participation in, community programs, and identification of responsible members of the company with community projects.

d. Open-house days, when the public is invited to inspect property, operations, and facilities.

e. Educational and training programs that supplement, rather than conflict with, those offered in the local educational system.

f. Buildings and grounds that are sources of community pride because of their appropriateness and harmony with the general physical appearance of the community.

The failure to make concerted efforts at gaining public good will occasionally is made manifest by the issuing of petitions that the company be removed from the community. More frequently it becomes evident in a refusal to use company products or to patronize company-sponsored events. Some indication of differences in public attitudes toward different companies is given in two studies that are reported by Hepner.[1]

a. In one city a comparison was made between public attitudes toward two of the leading department stores and between attitudes toward two public utilities. One department store was given a 20 per cent more favorable judgment than the other, and one utility was rated 70 per cent more favorably than the other.

b. Two department stores made separate studies of the reasons why a cross section of their lost customers had ceased to patronize the stores. One study disclosed the fact that 82 per cent of the customers had left because of unadjusted grievances and company indifference, and the other study showed that 94.4 per cent of the losses were due to these factors.

The recognition of the importance of public good will is reflected in the appointment of public relations counselors in some companies, or in the addition to the personnel department of one member whose major responsibilities are to maintain a running record of the public pulse, and to discover and remedy those factors that may be responsible for ill will and antagonism.

ADVERTISING

Advertising is the medium by which the business and industrial world announces its services and products to the consumer. The advertising department and the sales department are the two chief outlets through which a company is brought into contact with the outside world. The two departments are different in their function and purpose, and use different psychological factors in attempting to win the support of the consumer. The aim of the advertiser is to awaken interests, to create wants, and to provoke inquiries; the aim of the salesman is to activate

[1] HEPNER, H. W., *Psychology in Modern Business*, pp. 463–497, Prentice-Hall, Inc., New York, 1930. See also STRONG, E. K., *Psychological Aspects of Business*, pp. 145–158, McGraw-Hill Book Company, Inc., New York, 1938.

interests and to satisfy wants. The end of the advertiser is gained when an inquiry is made or an order is placed; the end of the salesman is gained only when the customer has acquired the habit of using the particular product manufactured by his company.

Because of its general nature, advertising appears in a variety of forms. Sometimes the end can be gained by members of the company becoming identified with worth-while social, religious, and educational organizations. At other times the result is attained by the company's becoming identified with a national hero; at other times, by the production and distribution of literature and the results of research studies; and at still other times, by contributions to nationally known welfare and service organizations.

The principal channels that are used by the advertiser are the printed page and the spoken word; it is in relation to the form and likely effect of these that psychologists have given the world of advertising a number of worth-while contributions.

In its attempt to arouse interest and provoke inquiries, the world of advertising is handicapped by the fact that those to whom the advertisement is addressed are in various stages of interest in the product and represent various states of mind in their attitude toward the company.

Some are already interested in what is offered, feel a need for the product, and require only direction and knowledge to consummate the act. These are the easiest participants. If advertising were addressed only to them, the problem would be a relatively simple one—merely that of conveying adequate information in a convincing manner to those who are ready for action, and providing sufficient inducement to cause that action to be directed in the advertiser's channels.

Some are interested in the product in a general way, but have not made their wants or demands specific; the conscious need exists, but the particular brand of product which will satisfy that need is unknown. Advertising to and for this group of possible clients presents difficulties; competitors, products of different quality and price, and the attitude taken toward other organizations with which the advertiser is competing are the factors that determine the form the advertisement ought to take and the response it will be likely to bring.

Some are ready to exchange available money for goods, but have no idea of the kind of thing they will buy. These comprise the group who offer the greatest challenge to the advertiser's ingenuity. Arousing dormant desires, presenting attractive displays, creating needs, and securing responses among this group are much more difficult than is the incitement of those who feel a definite need.

Some are among the hopeless and impossible; either they can't buy, or they won't, or they are resolved not to buy. They are (or think they

are) impervious to advertisements, to sales talks, and to any other form of persuasion.

Psychological Principles in Advertising.—It would be a happy solution of the advertiser's problems if he knew these separate groups and could address his advertising to different members in different forms. Unfortunately, he has to address it to the general public, or at least to a selected economic section of the public, and in doing so is quite often limited to platitudinous appeals and vague generalities. His selection of the tools that will impress his wares upon the attention of the needy or the interested is largely a gamble and an act of faith and hope; his chances of success depend upon the basis on which he places his advertisement.

It is for the sake of aiding the advertiser, because of the gambles and chances he must take, that the psychologist offers the advertising world some results from laboratory and field experiments, that may help to lift his acts from the realm of pure chance and give a moderate degree of security to his venture. It would be fortunate if the psychologist could present some universal laws that apply to advertising. An occasional psychologist has formulated laws of human behavior; why, then, should they not be applied to the specific situation that confronts the advertiser? The difficulty lies in the fact that much of human behavior is unpredictable, and any attempt to formulate laws is doomed to challenge, if not to contradiction. Mabel Gragg says,[1]

> There is, in fact, scarcely a conclusion of one investigator that has not been contradicted by the findings of other investigators of equal standing. This may mean that after all it is impossible to arrive at general laws or tendencies which would enable one to forecast within reasonable limits the effect of given advertisements, or it may merely mean that no adequate steps have been taken to discover the rules.

The psychologist can offer suggestions that have been of value in similar situations, and can supplement experience with experiment, and hopes of how people will act with definite knowledge of the way they have acted in similar situations in the past. Among the suggestions that the psychologist offers the advertising world are the following:

a. People react to *wholes* rather than to *parts.* Translated into advertising terminology, this means that people will react to the entire advertisement as a unified, concrete whole rather than to isolated parts of an entity.

b. The *whole* must have an *anchorage point, i.e.*, there must be a pivot around which the advertisement revolves and to which the accidental and incidental parts of the advertisement contribute. That anchorage point should be the most important part of the advertisement, the message that the sponsor wishes to convey to the public.

c. The anchorage point must be of sufficient interest, prominence, or distinction to be readily and easily noticed. That may be secured directly or indirectly; through

[1] GRAGG, MABEL TAYLOR, Testing Advertising, *Harv. Bus. Rev.*, 9: 118, 1930–1931.

everyday occurrences or through unusual channels; by means of poetry, prose, or nonsense; by the use of a picture, a drawing, or a comic illustration; or by the grotesque and the absurd. The criterion of effectiveness of whatever tool is used is the degree to which it draws attention to the central issue of the advertisement.

d. Action starts only when interest has been aroused, desire has been created, and a want has been intensified. For that reason the advertisement should strive to accomplish all three. In cases where wants already exist, the advertisement takes the form of news and information, and does not depend for success upon the excitement of dormant states.

e. Action usually results from efforts to gain satisfying experiences or to avoid annoying situations. The advertisement may be directed toward the one or the other, *but* the experience must be a desired one, and the situation must be one of which many people are vividly aware. Creating annoying situations, manufacturing hypothetical conditions, or representing states of which very few are conscious will fail to produce the effects that correct representations of actual occurrences will produce.

These suggested principles of human behavior are neither exhaustive nor complete; they represent modes of activity with which the advertiser must be concerned if his work is to be effective. It is obvious that the most important part of an advertisement is the anchorage point, the central theme.

THE ADVERTISING THEME

The theme of the advertisement is the message that the advertiser wishes to give; it is the most crucial part of the advertisement, the one which, as Link says, "dwarfs all others in comparison." That message may be dressed up in a variety of forms, aided by illustrations, colors, coupons, offers, and any number of incidental factors; the essential fact to be borne in mind is that the dressings should not act as a distraction, but rather point to the purpose for which they are intended.

TABLE 122.—RESULTS IN TERMS OF COSTS OF TWO ADVERTISING THEMES

Copy	Magazine number								
	1	2	3	4	5	6	7	8	9
A	.85	.20	.66	.31	.68	.42	12.35	.36	.29
B	3.47	1.03	7.50	1.02	4.57	14.20	18.22	1.03	1.29

The importance of properly wording the message so that it is directed "for a particular commodity, in a particular place, at a particular time" is evidenced from a number of studies that have been made. Goode and Powell[1] report some results from two advertisements which were placed in corresponding spaces in the same magazine at different times,

[1] GOODE, K. M., and H. POWELL, JR., *What about Advertising*, pp. 11–12, Harper & Brothers, New York, 1927.

and which differed from each other only in the copy theme. The results, in terms of the cost of the advertisement as judged by the number of inquiries that each advertisement elicited, are given in the table on the preceding page.

Tested Characteristics of the Successful Theme.—In the report that is summarized in Table 122, sometimes copy A and sometimes copy B appeared first; the contrast is sufficiently striking to show the key importance of the copy theme. What should that be like, and how should it appear? Some conclusions that are justified by experiments and experience may be summarized.

1. The theme should be directed to the reader, rather than centered around the experience of the writer; it should be alter-centric rather than egocentric. What it can do for you and what it has done for others are of more importance than what it is like or how it is made. Goode and Powell point out that such an attitude has been an essential qualification of producers, and credit Henry Ford's early success to the fact that he built a car that the other fellow wanted rather than one that he wanted himself.

2. The theme should avoid superlatives, promises, and exaggerations. Truth in advertising is the foundation stone on which confidence in its message rests. Since 1911, when *Printers' Ink* published what has since become known as "The Printers' Ink Model Statute," the campaign for truth in advertising has been waged by advertisers, with the result that 38 states in the Union have adopted it, or a slightly modified form of it, and have made dishonest advertising a misdemeanor. In 1912 The Advertising Clubs of the World, at their annual convention, adopted the motto, "Truth in advertising," and, with the aid of national vigilance committees and better business commissions, have succeeded in eliminating dishonest and much objectionable advertising. In support of these organizations, some of the leading newspapers and magazines have formulated codes that penalize the advertiser for any attempts at deception. Truth, today, is a legal necessity.

On a par with deception and as distasteful in tactics is the use of superlatives or exaggerations. To be effective, an advertisement must be believed. Belief is fostered and strengthened when moderation marks the keynote of the advertisement; superlatives and exaggerations are met with challenges and doubts rather than with credence and acceptance. Despite this fact, the frequency with which superlatives occur is surprising. In one study[1] of the advertising used by five motion-picture houses in one city during a 6 months' period, Hepner reports the word "greatest" occurring 21 times; "perfect," 12; "a sensation," 9; "most," 6; and "super-special," "best," "100 per cent," "highest," and "wonder-

[1] HEPNER, *op. cit.*, p. 537.

ful," 4 times each. The obvious shoulder shrug of the movie patron after seeing the "greatest" picture represents the feeling of disappointment that undue promises have fathered.

3. The theme should show a sincere interest in an accurate presentation of the facts, and in the person whom it attempts to influence. The move for sincerity in advertising is recent, and probably will never reach the stage that "truth in advertising" has reached, but it is a characteristic that is becoming increasingly frequent. An interesting illustration of this is given in the following advertisement, which Seagram Distillers[1] used:

> No person should spend a cent for liquor until the necessities of living are provided—and paid for. Bills for groceries, clothes, rent, light, heat, doctors, have the first call on America's payroll.
>
> We don't want to sell whiskey to anyone who buys it at a sacrifice of the necessities of life. Whiskey is a luxury and should be treated as such. Fine whiskey can play a pleasing part in the scheme of gracious living . . . but only when taken in moderation and only after the bills are paid.
>
> This statement may seem contrary to our self-interest. Actually it is not. As one of America's leading distillers, we recognize a definite social responsibility. The very existence of legalized liquor in the country depends upon the civilized manner in which it is consumed. In the long run we believe it is good business for us to say, "Pay your bills first."

Interesting confirmation of the value of sincerity in advertising is shown in a survey made by the Psychological Corporation[2] in which the question was asked, "What brand of cigarette has the sincerest advertising?" as well as, "Have you changed your brand within the last year? If so, from what brand ______ to what brand? ______" "The answers showed a high correlation between changes in brands and the opinions expressed in regard to the sincerity of the advertising."

4. The main idea in the advertisement should not conflict too sharply with normal experiences. The reasonableness of a solution for a difficulty should be apparent, and the improvement over recent or other products should be made clear in such a manner that the average person will understand it. For that reason, except in technical journals, the advertisements should use technical terms and descriptions of details sparingly, and the end or purpose that the object serves, rather than the object itself, should be the center of emphasis. Definiteness of purpose and clarity of description are cardinal virtues of successful advertisements.

5. The theme should tie up closely with common wants and desires. Appeals to normal human tendencies have been the keynote of advertising for the past 30 years; they will be discussed later. One caution is neces-

[1] Quoted in *The Reader's Digest*, 32: 77, March, 1938.

[2] LINK, H. C., A New Method of Testing Advertising Effectiveness, *Harv. Bus. Rev.*, 11: 172, 1932–1933.

sary: the appeal should be appropriate to the product and directed toward the central issue of the advertisement. Fundamentally, appeals are accessories to advertisements; making them the core of the advertisement will be likely to center attention on the appeal rather than on the manner in which the product may satisfy normal desires.

6. The theme should be specific and definite. No concern is interested in advertising cars and radios in general; the primary interest of a particular concern is in a specific car and a specific radio. Repeated surveys of the Psychological Corporation have shown that competitors of an advertiser benefit more from his advertising than he does. Generalities may have general effect; the end of advertising is specific returns for a specific company. For that reason, the advertisement should be directed to the establishment of an association between the particular brand of a product and its name, quality, and general desirability.

7. Except in technical journals, the advertisement should contain a minimum of descriptive matter, should not attempt to impart technical information, and should give a minimum of details. Technical descriptions are rarely understood or read. An interesting illustration of this is given in a survey made by the Psychological Corporation.[1] When the electric clock was first manufactured, the makers were so impressed with its mechanism that their advertisements contained detailed descriptions of the parts, the "synchronous motor," the "power-house generator," the regulation by "the alternating-current electric outlets in your home." A survey was made of people who were using or contemplating using such clocks, and it was found that the features most often mentioned were the irritations which the clock overcame: no longer was it necessary to wind the clock, to call on the telephone for the correct time, to keep the clock 5 minutes fast so as to be sure to catch the train, etc. These were its common advantages; its mechanism was unknown, and very few were interested in it. Yet, until the survey was made, no advertisement had been centered around these obvious ends that the clock could serve. Descriptive advertising is rarely as effective as is purposive advertising. The mechanism appeals to the technical-minded scientist; the use appeals to every home owner.

8. The theme of the advertisement will be noticed in proportion as it looks easy to read, is broken up into small units, appears under each separate illustration, and contains material of general interest that is not commonly found in advertisements, *e.g.*, items of general information, menus, recipes, rhymes, styles, and how-to-do messages.

9. The style in which the central theme is to be expressed and through which it will effectively gain attention seems to vary from time to time.

[1] Quoted by H. C. LINK, *The New Psychology of Selling and Advertising*, pp. 29–33, The Macmillan Company, New York, 1932.

Advertising styles seem to move in cycles each stage of which is a preparation for the next, and the general pattern of which seems to be determined to some extent by the outstanding and popular methods in vogue in other relationships.

Advertising Forms

Fundamentally there are only two forms that advertisements may take, the "reason-why" and the "suggestion" type—sometimes called the "long-circuit" and the "short-circuit" appeal—but the style in which these forms may appear varies from time to time.

The "Reason-why" Advertisement.—This type assumes that readers can be persuaded to buy an article if they can be given sufficient arguments in its favor. Sometimes an attempt is made to locate a difficulty, and then show its cause and the method of prevention. For example, a tire manufacturer displays a tire that breaks near the rim of the wheel, explains the cause of the break, and then proceeds to show how, in the construction of his tire, such breaks are impossible.

The "reason-why" advertisement may have many variations; sometimes it is in the form of a logical presentation of facts, in which careful explanation is given of the method of construction, the mode of operation, and the uses to which the mechanism may be put; at other times, the facts may be presented in a most unreasonable fashion. Burtt[1] quotes one instance in which this type was successful. A sausage company was selling a high-quality homemade product at 2 pounds for $1.75. In the fall of 1930 the company used the following copy in advertising:

> However, because of the decrease in the price of raw material, the price has been increased to $2.00 for two pounds.

Burtt reports that the advertisement resulted in an increase in the number of customers and in the amount sold, over a corresponding period in the previous year.

At times the "reason-why" advertisement is presented in the form of a comic strip. This form owes its wide use to the discovery made by Dr. George Gallup that the majority of men read the "funnies." The advertising world, taking advantage of a temporary national fad, capitalized on the idea, and converted many of the customary logical presentations of facts into entertaining talks. The extent of the use of this type of advertisement is indicated by the fact that in a selection of 100 best advertisements made by John Caples,[2] in 1937, 14 of them were composed chiefly of comic strips. Their popularity has been due to a

[1] Burtt, H. E., *Psychology of Advertising*, p. 98, Houghton Mifflin Company, Boston, 1938.

[2] Caples, John, *Advertising Ideas*, McGraw-Hill Book Company, Inc., New York, 1938.

universal interest in humor, drama, suspense, and action, and to the opportunity they give the advertiser to avoid prolonged discourse, and to allow abstract characters to express the very ideas that he wishes to convey to the public. Such advertisements have appeared in a number of forms and for as many purposes: to stress profit possibilities, to display products, to illustrate embarrassing situations, to personalize products, to let professional representatives express opinions on products, and to highlight the chief selling talk of a commodity.[1] As a style, it represents a passing fad, which, as has been true of many other fads in advertising, will "have its day and cease to be."[2]

"Reason-why" advertising is founded on the assumption that acts are based on reason, and that reason and logical thinking determine behavior. Psychoanalysis has been responsible for dislodging this concept from the minds of many and has succeeded in convincing a great number of us that we are creatures of emotions rather than of reason. The extent to which reason determines behavior is directly related to the validity of the "reason-why" advertisement in determining buying acts.

Suggestive Advertising.—Such advertising makes its appeal to the emotions and values of the reader, and is based on the assumption that the creation of desires, pleasant-feeling tones, or dissatisfaction with a situation will result in the purchase of the form of satisfaction the product offers. Its aim is to get an idea so vividly in the mind of the prospect that he is haunted by its presence, and eventually does something for his own satisfaction or release. Suggestive advertising has taken many forms, the chief of which are treated under direct and indirect suggestion.

1. *Direct Suggestion.*—This is used either in the form of a command or a sign whereby, with an insistent and persistent finger or arrow, the observer's eye is drawn to the object that is displayed. This type of advertisement is successful in proportion to the prestige of the company and the subservient attitude of the observer or reader. Burtt points out that it is much more common and successful in countries with dictatorial forms of government than it is in democracies.

2. *Indirect Suggestion.*—This kind attempts to create atmosphere and prestige by displaying the product in an elaborate setting or in a comfortable or lucrative position. The advertisements of du Pont, Packard, and Cadillac make use of this type of copy, sometimes decorating the advertisement with a reproduction of an oil painting, a picture of a prominent person, or the testimony of a famous actor or prominent

[1] An interesting discussion of the value of comic strips will be found in *Printers' Ink Weekly*, Jan. 13, 1938, p. 35.

[2] In this connection, it is interesting to note that Mr. Summer in 1937 thought the comic strip "on its way out." See SUMMER, G. L., Current Fashions in Advertising Technique, *Advertising and Selling*, Sept. 9, 1937, pp. 26–27, 67.

official. The value of either the atmosphere or the testimonial depends upon the appropriateness of the one and the reliability of the other. The testimonial has value today, if used in local papers with local testimonials from people of trust and merit in the community; and, if used in national advertising, when it accompanies products about which the person giving the testimony knows a great deal. The average person, for example, would take the testimony of de Seversky relative to an airplane, but would hesitate if he were to sponsor a cold cream. This limitation on the value of testimonials has been due to the misuse of the tool by public servants who are anxious to capitalize on their popularity; the misuse of the tool is best in evidence in the wide sponsorship given to nearly every conceivable article by actors, actresses, and an occasional champion in sports. Thanks to such organizations as "Famous Names, Inc.," many prominent names are used to endorse any type of product if the manufacturer is willing to pay for the use of the name.[1]

Another form of indirect suggestion that has been in use is that of the embarrassing or distressing situation, sometimes called the negative appeal. Illustrations of the successful use of this type of copy abound: the car stalled because of the lack of a Philco battery, halitosis because of the failure to use Listerine, intestinal trouble because of the failure to use Fleischmann's yeast—these are outstanding examples of the successful use of such a type. That types of this kind can be successful is shown in a study reported by Lucas and Benson[2] in which a comparison was made between the sales returns from positive and negative copy. Out of 28 advertisements for educational courses, the returns, as measured by cost per sale, averaged $15.28 for the positive copy and $15.09 for the negative; and out of a total of 28 forms that were used, 12 of the negative were lower than the positive. However, the dangers that threaten this type of copy are many. For instance,

a. The negative part of an advertisement may be the only one that strikes the eye, especially when but a small section is read.

b. People are liable to associate the product with the distasteful and unpleasant picture.

c. The negative appeal makes exaggeration easier and readily leads to a discounting of the importance of the occurrence.

d. Many people are more sensitive to errors and weaknesses than they are to remedies, and notice them more easily.

MAJOR FACTORS AIDING THE THEME

The factors that draw attention to the copy theme, and give moderate assurance of its being noticed by a fair percentage of the readers, are

[1] For a discussion of this topic see, Burtt, *op. cit.*, pp. 63–91.

[2] Lucas, D. B., and C. E. Benson, *Psychology for Advertisers*, p. 268, Harper & Brothers, New York, 1930.

of primary importance. Some of these will be discussed later; others are obvious. Legible type, good spacing, lines, arrows, unconventional arrangement, etc.—all these are accessories that point to and make readable the central issue of the advertisement. Supplementing them are other important and essential parts of the body theme that merit separate consideration; among these, the headline, the slogan, the trade name, the illustration, and the general nature of the appeal are of major importance.

The Headline

The most important accessory to the theme of an advertisement is its introduction. The headline is the salutation, the announcement that is intended to arrest the attention of the casual reader to such an extent that his curiosity will be aroused sufficiently to cause him to pause and investigate the contents of the message. Just as the title of an article determines who will and who will not read it, so the title of an advertisement draws or repels the readers. Its attention-arresting capacity is determined by a number of factors, chief among which are the nature of the greeting, its length, and the form in which it appears.

Nature of the Contents of the Headline.—With its primary purpose that of arresting the attention of the reader, the headline must necessarily appeal to his interests; it must touch off a pattern of behavior that he frequently expresses or that he is eager to express. Caples[1] says the most successful headlines are:

1. *Headlines That Appeal to the Reader's Self-interest.*—The more universal the interest to which the appeal is addressed, the more likely will the headline be to attract the attention of a large percentage of readers. The qualification must be made, however, that the interest to which the appeal is made must be related to the theme of the advertisement. The most glaring abuse of this principle, which has been recognized as an important one by advertisers for some time, is the manner in which the sex appeal has been used in connection with products that have not the most remote relation to the sex life of the average reader. The nature of the appeal should be determined by the form of satisfaction offered by the product; these forms are as varied as human interests and needs.

2. *Headlines That Give News.*—When the product being advertised is already well known, the news may be related to unusual features concerning the product; when, on the other hand, the product is not well known, the use of news is limited by the relation of the news to the product in the advertisement. An interesting abuse of this appeared some time ago in an advertisement in a city newspaper, thus:

[1] Caples, John, *Testing Advertising Methods*, pp. 17–29, Harper & Brothers, New York, 1932.

Robbery: Last night some jewelry was stolen from a home on Northampton Street—buy ______ coal.

The robbery incident might well have been capitalized by a hardware store interested in selling safety locks, but the connection between the robbery and the coalbin is very remote. An interesting use of the news feature was made by a Toronto department store.[1]

A Toronto department store, visited one night by burglars, lost no time capitalizing the event. The safe door, with its gaping hole, was displayed in the window, along with three oxtacetypele tanks, a blow-torch, chisels and other tools of the trade, and a framed newspaper account of the scene of the crime. Dresses were displayed in the background.

"They break in at night and rob us," proclaimed the advertisement, "but you can come in broad daylight and rob us at these bargain prices."

3. *Headlines That Arouse Curiosity.*—Mere curiosity appeals by themselves have very little value; the appeals should be so formulated that news or items of self-interest are indicated. Caples[2] suggests that headlines that begin with the following words or items will have the most arresting power: "how," "how to," "new," "now," "free," "wanted," "at last," "this," "they laughed," "advice"; as well as announcements, money headlines, amazing headlines, and one-word headlines.

The Laureen Company[3] gives a contrast between the types of headlines which are recalled and noticed easily and those which are not noticed. They are summarized in Table 123.

TABLE 123.—"GOOD" VERSUS "POOR" RECALL HEADLINES

Good Characteristics	Poor Characteristics
1. Legible type	1. Poor type
2. Use of single, simple, readily comprehended idea	2. Use of complex, obscure, or involved idea
3. Conveying understandable information	3. Information difficult to understand
4. Human appeal	4. No or poor human appeal
5. News interest	5. No news
6. Brevity	6. Longer and looks harder to read
7. Tie-up with subjects of general interest	7. No tie-up with subjects of general interest
8. More favored position in layout	8. Less-favored position
9. Unconventional presentation	9. Conventional presentation
10. Close tie-up with illustration	10. No tie-up with illustration
11. Making its point without aid of copy	11. Getting its significance from copy reading
12. Giving information about personalities	12. No personalities

[1] Quoted from *Canadian Advertising* by *The Reader's Digest*, 31: 108, December, 1937.

[2] CAPLES, *Testing Advertising Methods*, pp. 58–71.

[3] Reported in H. H. BORDEN, *Determination of Confusion in Trade Mark Conflict Cases*, p. 521, Harvard Business School, 1936.

The frequency with which different types of headlines are used is indicated in a survey of the types used in 1 year by *The Saturday Evening Post*[1] and summarized in Table 124.

TABLE 124.—TYPES OF HEADLINES USED IN MAGAZINES IN PER CENTS
(After Warden)

Contents of headline	Size of advertisement			
	Page	Half page	Quarter page	Less
Name of article	34	40	49	38
Name of firm	1	0	2	0
Selling point	30	24	24	6
Indirect heading	24	24	14	12
Blind heading	1	1	7	0
Command	6	6	1	29
Question	4	5	3	15

If it is borne in mind that the contents of the headline serve two purposes—to catch the reader's attention and to introduce the reader to the central thought of the message—the type of content will naturally be determined by what is being introduced and the audience to whom the introduction is being made.

The Length of the Headline.—This is determined by the capacity to grasp in one glance the contents of a unified whole. Repeated experiments with letters, numbers, symbols, and words, exposed for $\frac{1}{10}$ second, by the use of the tachistoscope, have shown that the average person can grasp a maximum of from six to seven units in a single act of attention. On the other hand, surveys of headline lengths show that common practice runs counter to this limitation. In one survey of the advertisements in *The Saturday Evening Post*,[2] covering 5 successive years, while the most commonly used length was 3 words and the average length 5, there were many headlines that contained more than 12 words. In the same report it was found that the average word length in headlines was 5 letters, but that a number of headlines contained words with 16 letters.

The Distinctiveness of the Headline.—This is determined by uniqueness and legibility. Uniqueness is unusualness in a setting. In a magazine or à newspaper or on a street in which the majority of the headlines are in one type, *e.g.*, **Bodoni**, the appearance of such a distinctly different type as **Cloister Black** draws attention because of the contrast.

[1] WARDEN, C. J., W. A. RORISON, and S. B. SOLINGER, Tendencies in the Use of Headlines in Magazine Advertising, *Jour. Applied Psychol.*, 9: 225–229, 1925.
[2] *Ibid.*, pp. 225–229.

The variations in the use of different type faces illustrate the extent to which this principle is used. In 1934, S. H. Giellerup[1] made a survey of the October issues of *The Saturday Evening Post* for four different years, and computed the extent to which the more common type faces were used. Table 125 gives the percentages for the 13-year period.

TABLE 125.—CHANGES IN USE OF THE DIFFERENT TYPE FACES IN 13 YEARS IN PER CENTS

Type face	Years			
	1921	1925	1929	1933
Caslon	39.0	28.0	17	23
Bookman	23.0	8.5	2	3
Cheltenham	18.0	4.5	1	3
Garamond	0.0	11.0	24	13
Goudy	6.5	30.0	3	0
Kennerly	10.0	12.5	5	0
Bodoni	0.0	0.0	39	32
The Gothics	0.0	0.0	10	10
Scotch Roman	0.0	0 0	0	6
Century	0.0	0.0	0	6

The results show a continual change, from year to year, with Caslon, Garamond, and Bodoni in temporary favor, and with The Gothics, Scotch Roman, and Bodoni on the increase. Uniqueness may be secured by interspersing a headline from one "family" among headlines that belong to another family. American Typewriter will be somewhat conspicuous if juxtaposed to such type faces as **Cheltenham**, Scotch Roman or Caslon, but will be more conspicuous if it is found among headlines in Cloister Black or Old English. Sometimes uniqueness can be gained by combining upper and lower case in one headline. Warden reports a steady increase in the use of such a combination during the past 25 years.

The legibility of the headline is determined by the heaviness of the horizontal and vertical strokes. Some type faces, *e.g.*, **Cheltenham**, are legible at one and one-half times the distance of others, *e.g.*, *Bodoni.* Legibility is dependent also upon familiarity, both with respect to the type used and the contents; it is for that reason that the more unusual types, *e.g.*, Old English and Cloister Black, are not so legible as are **Cheltenham** and Bodoni. The same factor militates against the efficiency of the italicized type.

How important legibility is in a headline is questionable. The headline serves the purpose of attracting attention and introducing the theme;

[1] GIELLERUP, S. H., What the Depression Years Have Done for the Ads, *Advertising and Selling*, 23: 25–26, 40, Aug. 30, 1934.

its uniqueness, rather than the distance at which it can be read, gives it arresting power.

The Illustration

Illustrations may be of many different kinds. Pen-and-ink drawings, wash drawings, photographs, and combinations of any two, or all three, are the most commonly used. The tendency during recent years is to make increasing use of the photograph, at the expense of the pen-and-ink illustration. Whereas pen-and-ink illustrations fell from 92 to 22 per cent of all illustrations between 1895 and 1920, photographs increased during the same period from 4 to 17 per cent, and have shown a rapid rise since then. In one study of October issues of *The Saturday Evening Post*[1] for four different years, 1921, 1925, 1929, and 1931, the percentages of advertisements using photographs were 32, 25, 40, and 61 respectively. Kitson reports an increase of from 22 to 92 per cent in newspaper use of illustrations, and from 29 to 68 per cent in magazine use, in the 30-year period, 1895 to 1923.

Factors Accounting for the Use of Illustration.—The use of the illustration, particularly the photograph, is due to a number of factors.

1. *Human-interest Value.*—As a means of arresting attention, the human-interest picture has more value than any other tool. Proof of this is found in numerous directions: the popularity of such magazines as *The London Illustrated News, Look, Life;* the repeated surveys of newspaper-reading habits, showing the picture page read more frequently than any other. One Gallup survey[2] showed that 90 per cent of women and 86 per cent of men subscribers always read the picture page of the large metropolitan dailies.

2. *Returns from Illustrated Copy.*—Well-illustrated advertisements bring large returns. Table 126, summarizing three experiments in which the same advertisement appeared in one case with and in another without pictures, represents the increases that are due to the illustration.

3. *Help in Understanding.*—Illustration makes the advertisement easier to understand, by presenting material that can be grasped in one act of attention when, if given in written form, it would require a much longer time. This is particularly true when technical parts are being described. One diagram or picture clarifies a complexity where descriptions would but add confusion. This is due primarily to the fact that most people are visual-minded and can retain an image of a picture much more easily than they can an image coming from any other sense organ.

[1] *Ibid.*, p. 25.

[2] Gallup, Dr. G., I Asked 100,000 People What They Read in the Newspapers, *Advertising and Selling*, 30: 41–43, January, 1938.

4. *Pleasure-giving Quality of the Picture.*—When presented attractively, the picture has a pleasing effect, and lends itself, in homes where children and art lovers are, to possibilities of being clipped from the magazines, thus having additional opportunity of being repeatedly observed.

TABLE 126.—EFFECTS OF ILLUSTRATIONS ON ADVERTISING RETURNS

Nature of advertising	A (no illustration) compared with B		
	A	B	Differences
Memory course[1].....	Full page, three column, 8 point type	Picture on 1/8 page, rem. 6 point	Unit sales reduced $1.50, 66%
Small watch[2]........	All copy	Picture of watch; less copy	124% more inquiries, 33% more sales, 62% increase in purchases
Educational[3]........	20 lines copy	16 lines copy; illustration	1/2 inquiry cost; 1,100% more sales.

[1] RHEINSTROM, C., Picture Cuts Memory Course Sales Cost, *Advertising and Selling*, 10: 30, Mar. 7, 1928.

[2] STRONG, E. K., *Bulletin* 8, The Association of National Advertisers, 1914.

[3] Computed from Table 103, p. 566, of STARCH, D., *Principles of Advertising*, McGraw-Hill Book Company, Inc., New York, 1923.

Types of Illustration.—Illustrations can be divided, as can advertisements, into two groups—the "we" group and the "you" group—the former including illustrations of the product, the method of manufacture, the constituents, the owner, the factory, or the trade-mark; and the latter including illustrations of the product in use, the results of using the product, the surroundings in which the product may appear, or some dramatic incident caused by its use. The effectiveness of an illustration is dependent upon its attention-getting power, its recall value, and its action-producing value; these will be somewhat determined by the type of illustration that is used. Experimental proof of the contrasting effects on attention of different types of illustration is given in a study made by Nixon, in which advertising illustrations were presented tachistoscopically in contrasting series, and were later tested for their recall value. The results from some of the studies are given in Table 127.

These results would seem to indicate that large illustrations of people will arrest attention and be remembered better than any other kind. With the theme remaining constant, and the advertisement's change consisting of the picture of a person instead of the picture of an object, Nixon found the person advertisement to be fixated 23 per cent more often and to hold the attention 31 per cent longer than the object advertisement. The results that Nixon secured for his irrelevant illustrations may be dis-

counted, because of the fact that his measure of recall was the subject's capacity for identification.[1]

A more typical measure of the value of the irrelevant illustration is given in a study made by Laslett.[2] Two "made-up" copies of *The Saturday Evening Post*, each containing an equal number of relevant and irrelevant illustrations, were given to observers for 5 to 7 minutes of study. After 2 days they were asked to list the illustrations they remembered, and to identify them by giving either the trade name, the name of the firm, or the exact name of the product. His results showed that the relevant illustration had two and one-half times the recall value of the irrelevant. The irrelevant illustration may serve the purpose of catching the attention and arousing sufficient curiosity to cause the reader to seek an explanation in the theme; associations, however, are built up more easily when they are between similarities than when they are between oddities and bizarre forms of expression. The irrelevant illustration has the same danger points that the negative appeal has—its occasional effectiveness is the exception rather than the rule.

TABLE 127.—ATTENTION AND RECALL VALUE OF DIFFERENT TYPES OF ILLUSTRATION

Type of illustration	Number of times fixated			Average number of recalls
	First	In 10 sec.	In 30 sec.	
a. People (men)	18.93	12.05	34.97	4.65
versus				
Objects	15.07	7.95	25.03	2.75
b. Women and children	15.56	11.91	33.15	3.15
versus				
Objects	14.43	8.09	26.85	2.22
c. Large illustration	15.27	9.98	28.73	5.42
versus				
Small illustration	14.73	10.02	31.27	3.07
d. Relevant	18.93	9.09	26.80	2.29
versus				
Irrelevant	19.46	10.91	33.20	3.45

Characteristics of Good Illustrations.—The outstanding element in the illustration should be related to the central theme of the advertisement, and the other parts of the illustration should contribute to, rather than detract from, the effectiveness of the central element. Illustrations may

[1] NIXON, N. K., Attention and Interest in Advertising, *Arch. Psychol.*, No. 72, 1924.

[2] LASLETT, H. R., The Value of Relevancy in Advertising Illustrations, *Jour. Applied Psychol.*, 2: 270–274, 1918.

easily be "too good," and attract so much attention to themselves that they become an end rather than a means.

The illustrations should tie up with factors that are prominent in the minds of the readers. Human-interest elements, current happenings of national significance, national fads, heroes, games, the novel and the unusual—these provide the material in which many are interested. *Printers' Ink*[1] reports that in response to the offer of a copy of a picture of a youngster brushing his teeth while his little dog stood by his side, 115,000 people sent in a required Pro-phy-lac-tic carton and 4 cents in stamps; and in reply to an offer of the picture of a baby, 235,000 people sent in an Ivory Soap wrapper.

TABLE 128.—ESTIMATED VALUE OF TEN PUBLISHED ADVERTISEMENTS
(After Starch)

Company	Nature of advertisement	Attention value	Illustration value	Artistic value	Average
Group A:					
Kellogg's Corn Flakes	Boy eating corn flakes	85	100	70	85
Prince Albert tobacco	Old man smoking	80	100	65	82
Postum	Woman drinking	60	100	60	73
Hart, Schaffner, and Marx	Two men and a horse	50	95	50	65
Hind's cream	Child and sleigh	85	24	80	63
Group B:					
Hart, Schaffner, and Marx	Mardigras	40	19	30	30
Ivory Soap	Mother and child reading	45	19	40	35
Ivory Soap	Mother putting stocking on child	45	48	40	44
Shredded Wheat	Girl and dog	75	24	35	45
Gold Medal Flour	City in darkness	70	0	80	50

An illustration should be moderately simple, easily understood, and devoid of unnecessary and irrelevant decorations. The more attention it draws to the theme and the less it draws to itself, the more effective it will be.

It should avoid the distasteful, the grotesque, and the horrifying. To be effective and create a desire for the product it illustrates, it must create a pleasing effect. A snarling animal, a pained expression, and a state of confusion are poor pleasure producers, except for the sadistic.

Table 128 summarizes the attention value, the illustrative value, the artistic value, and the average of these three values of two groups of advertisements. Starch[2] gave 21 advertisements to a number of

[1] 235,000 Want This Baby, *Printers' Ink*, 158: 46, Feb. 25, 1932.

[2] STARCH, *op. cit.*, pp. 531–535.

men, and asked to have them rated on a 0–100 scale, for each of the three values. Table 128 summarizes the average judgments of ten of the advertisements, Group *A* including the best five, and Group *B* the worst five.

The fact that some of those in Group *B* have long since been discontinued, whereas some in Group *A* are still being used, is proof of the adequacy of the illustrations in that group. Those in Group *B* fail mainly because of their irrelevancy; their attention and artistic values are average or better, but their inappropriateness for the occasion and the product destroy their effectiveness in making an association between the illustration and the product.

MINOR FACTORS AIDING THE THEME

Internal Factors

Trade Names or Trade-marks.—Trade names may be of many varieties: the name of a manufacturer (Ford), the initials of the incorporated name of a company (Socony), the name of a town (Boston Garter), the name of a pioneer (Daniel Boone), the name of an inventor (Edison), an artificially coined name with meaning (Holeproof), or an artificially coined name without significance (Kodak). The selection of the trade name is the most important step in isolating the product and differentiating it from competitors.

The well-established trade name has many values. The following are generally accepted.

1. It acts as a symbol for the company and its products, and represents the quality and standards of the company.
2. Without a trade name, a company's products merge with similar brands, and leave the manufacturer dependent upon the tactics of individual salesmen.
3. It represents and is a synonym for public attitude toward the concern; it stands for the reputation of the organization.
4. It aids the standardization of the goods, with respect to quality, form, and price; thus it maintains uniformity.
5. It speeds up the pace at which goods can be handled. Strong reports that the average time used in the purchase of canned goods with a trade-mark is one-third of that with no trade-mark. It is thus a quick means of identifying the goods.

Because it has so many advantages, considerable time and money are spent by organizations in establishing a trade name that will identify them and their products. Repeated studies by the Psychological Corporation have shown that, despite the expenditure of hundreds of thousands of dollars, many trade names that are sponsored are not effective; the failure is due chiefly to the attempt at the impossible. The casual reader of advertisements will not make an association between a new trade name and a product unless there is an inherent, easily formed

relationship between the two. The following rules for establishing trade names have been repeatedly suggested by psychologists:

1. Associate the trade name with either (*a*) the act of purchasing the product, or (*b*) a want for the product, in which the trade name is the solution of the want.
2. Enlist the cooperation of salesmen in using the name whenever the product is handled—the spoken as well as the written word is necessary if the new association is to be made.
3. Reproduce the trade name or trade-mark in the advertisements in the same form and color in which it appears on the products.
4. Make the trade-mark or trade name (*a*) distinctive, markedly different from those of competitors, (*b*) short and simple—one that is easily pronounced or visualized, (*c*) attractive and appropriate.
5. When possible, associate it with something animate—a personality, a family, a familiar animal (when the animal provides a logical association).
6. When possible, make its association with the company rather than with one of the products.
7. Avoid superlatives, geographical names, and names that easily become distasteful.

The use of a trade name is exposed to many dangers and objections. The following are the most common:

1. Occasionally there is a tendency to raise the price or lower the standard, once the name has been established.
2. It may easily become confused with similar-sounding or similar-meaning trade names. Infringement laws protect concerns against undue similarity, but no law can prevent the mental confusion that two trade names can produce. An interesting illustration of this is shown in a study made by Paynter.[1] He selected 120 trade names—60 originals and 60 imitations which had become the subject of litigation—and gave them to 40 judges, asking them in each case to indicate whether the two names represented the same or different products. Table 129 indicates the per cent of confusion.

TABLE 129.—PER CENT OF CONFUSION OF TRADE NAMES
(After Paynter)

Original	Imitation	Per cent confusion	Original	Imitation	Per cent confusion
Sozodont	Kalodont	45	Bestyette	Veribest	30
Old Country	Our Country	45	Mother's	Grandma's	38
Peptenzyme	Penozyme	43	Magic	Magico	45
Electric	Electric light	50	Henderson	Anderson	55
Siphon	Siphon System	80	West End	East Ridge	70

3. Another danger to a trade name is its acquiring a meaning which the sponsor did not intend, and which tends to remain with the product, regardless of the changes

[1] PAYNTER, R. H., How Famous Trade-marks Are Protected against General Use, *Printers' Ink*, 156: 121–137, July 14, 1927, and A Psychological Study of Trade-name Infringements, *Arch. Psychol.*, Vol. 42, 1920.

or improvements that may be made; the experience of some makers of cars gives ample illustration of the effectiveness of such an association, once it is established in the minds of the public.

Slogans.—A slogan is a supplement to and complement of a trade name, carrying the chief advantages that belong to the trade name and many disadvantages. The fact that slogans cannot be either registered or copy-righted (they can be listed with bureaus that keep records of slogans) limits their value for any organization; the ease with which the jokester can convert a slogan into a ridiculous criticism, or complete a phrase, or abbreviate a quotation so that it is distasteful even to the company sponsoring the slogan, indicates the dangers to which the use of them is susceptible; the difficulty with which a slogan is associated with a particular product, and the questionable possibilities that the association has, render efforts at establishing the association of doubtful value.

It is true that some slogans have been effective; "Ask the man who owns one," "It floats," "Candy mint with a hole," "It's toasted," "His master's voice" are among the successful slogans that are identified with the company and its products by the majority of the population. On the other hand, among the 8,000 or more slogans that have been widely advertised, and the thousands of others that have been adopted and discarded, the majority have not been associated, by the average customer, with any particular product. To test the extent to which slogans have been associated with particular products, try to identify the sponsor of each of the following slogans:

1. "The light that never fails"..........
2. "It's off because it's out"..........
3. "The more you eat the more you want"..........
4. "Covers the earth"..........
5. "Concrete for permanence"..........
6. "No metal can touch you"..........
7. "Pure as the pines"..........

(The sponsors' names will be found at the end of this chapter.)

The contrast between the effectiveness of these less commonly known slogans and those with which the majority of people are familiar will serve to show the qualifications that a slogan must meet if it is to be effective.

1. It must be related to the general class of products, so that it will be limited in its general grouping. "It floats" could not possibly be applied to many articles.

2. It should be connected with the trade name or trade-mark or with some other identifying symbol of the company, so that the two earmarks always appear together. A slogan is primarily an explanatory phrase that adds meaning to the product and enhances its worth.

3. It should convey some meaning, either by implication or directly. "Ask the man who owns one" implies a challenge, a lack of fear of investigation, and a pride in ownership.

4. It should not be related to passing fads, nor make use of superlatives, nor be smirched with vulgarity. A slogan is a permanent attachment; at least the hope is that it will be. Fads and fashions fade away, superlatives are constantly being surpassed, and vulgarity is generally distasteful—and people will insist on ascribing character to organizations. On the other hand, a slogan that arouses curiosity, or produces pleasure by repetition (has a good feeling tone), or shows a distinctiveness that is an essential part of the product has a fair chance of being widely known.

5. It should be specific rather than general. The slogan, "70,000 of us invite you to ride on our railroad" is easily associated with a railroad, and probably with a major system, but not with any particular railroad. On the other hand, "The snap with a turtle back" is readily differentiated from other kinds of snaps.

Color.—One of the major changes in advertising since the beginning of this century has been the increasing use of color. Kitson compared the percentages in three magazines in 1905 and 1925, and found that 36 per cent of full-page advertisements were colored in 1925, against none in 1905. Lucas and Benson estimate that at the present time 50 per cent of magazine advertising is colored.

Reasons for Increased Use.—This increased use of color has been due to some proved facts and some assumptions.

1. The attention-getting capacity of the advertisement is multiplied by using color. Field surveys and laboratory experiments indicate that the colored advertisement has more attention and memory value than the black-and-white advertisement. Starch[1] reports that 54 per cent more replies were received from colored advertisements than from those in black and white, in a study of 3,972,747 returns from 2,349 advertisements. Nixon's study showed that the attention-getting power of the colored advertisement was but slightly better than that of the black-and-white variety, but that the memory value was 35 per cent higher. These values however are dependent upon a number of factors, including attractiveness, appropriateness, and the contrasts with surrounding advertisements.

2. The feeling tone of the advertisement is strengthened by the addition of color. Color is commonly considered to have one of three different effects: (*a*) as a sedative, inducing indifference, melancholy, or contemplation; (*b*) as a recuperative, inducing contentment and generosity; (*c*) as a stimulant, exciting hope, desire, ambition, and action. The individual effects produced by different colors vary. Colors have associations in past experiences and present contexts, and one's reaction is determined by the pleasantness of these, as well as by his present emotional state. Chandler[2] reports the consensus of judgment among a large number of subjects is that the exciting colors are red, orange, yellow, and purple;

[1] Starch, D., *An Analysis of* 5,000,000 *Inquiries*, D. Starch, 420 Lexington Avenue, New York, 1935.

[2] Chandler, A. R., *Beauty and Human Nature*, pp. 95–98, D. Appleton-Century Company, Inc., New York, 1932.

the soothing colors are green, blue, indigo, and violet; and the pleasing colors are green, purple, and blue. In common parlance, red is associated with anger and courage, blue with calmness, purple with stability and pomp, yellow with gaiety and warmth, and greenish yellow with cowardice and disease. The general tendency is to ascribe to an advertisement the same feeling tone that is given its predominant color.

3. The appearance of the advertisement is improved by color, and the desire for ownership of the product is increased. Sales returns of the effect of colored versus black-and-white advertisements repeatedly show those that are colored to be superior. Table 130 summarizes the results of some studied contrasts.

TABLE 130.—SALES RETURNS FROM COLORED VERSUS BLACK-AND-WHITE ADVERTISEMENTS

Nature of Business	Result
1. Mail-order firm with half of its catalogue in color and half in black and white	1. Colored ads. brought 15 times as much as black and white
2. Vulcanizing company compared cost of sales from the two types of advertisements	2. Colored cost 75 cents each, black and white $3.68 each
3. Direct-mail sales letter, some colored, some in all white	3. 9 per cent returns from white, 48 per cent returns from colored
4. Study of 162,000 replies to advertisements	4 Colored brought 63 per cent more replies than white

4. Color makes possible a more accurate presentation of the meaning of the object; the possibility of reproducing fruits and articles of clothing in their own color adds to the effectiveness of the appeal and aids the purchaser who wishes to make fine discriminations.

But, stating that color is more effective in gaining the attention and securing returns does not indicate which colors and which color combinations will be most effective. The color that will be most effective depends upon normal preferences and upon appropriateness to the product.

Color Preferences.—When articles are reproduced in their natural colors, the choice of a particular color is not an issue. When color is added to an advertisement, either to provide background for, or to give distinctiveness to, the product, the selection of a particular color or combination of colors is of paramount importance. Desirable colors have been studied in two ways: (1) as result producers, (2) as subjective judgments of preferred colors. Some reports of the results from the use of colors are given in Table 131. In column *A*,[1] the returns are reported from 1,000 sales letters in different-colored paper and envelopes. In

[1] WHITE, P. *Advertising Research*, pp. 553–554, D. Appleton-Century Company, Inc., New York, 1937.

column *B*[1] the report is given of the number of booklets taken, during a 14-day period, from five panels in the bank lobby of the Union Trust Company of Detroit. Column *C* summaries the results of a study made by Gallup on the memory value of different colors.

TABLE 131.—RESULTS FROM ADVERTISEMENTS AND DISPLAYS OF DIFFERENT COLORS

A (letters)			*B* (booklets)		*C* (memories)		
Letter	Envelope	Per cent return	Color	Number taken	Color	Per cent from average	
						Men	Women
White	White	9	Dark blue	162	Green	15+	27+
White	Blue	12	Brown	142	Orange	7+	11+
Corn	White	14	Pale blue	94	Red	0	3+
Green	White	16	Green	93	Blue	4−	5−
Gold	White	21	Light green	88	Brown	9−	14−
Pink	White	26	Yellow orange	87	Yellow	13−	32−
			Cream	87			
			Lavender	85			
			Orange	78			

It is interesting to note that the colors which were very effective in one campaign were below average or poor in another; green ranges from maximum to average, blue from maximum to below average, and orange from slightly above average to low, whereas yellow is consistently low.

Studies of color preferences also fail to show consistency; marked agreements are apparent, but equally obvious are the disagreements. Table 132 summarizes the results from four experiments. In each column the color combination found most satisfactory is given first, and the others are arranged in rank order with the poorest at the bottom.[2]

Various other studies of color combinations and preferences have been made,[3] and together show sufficient agreement to justify the following conclusions:

1. There is a decided preference for combinations made up of low brightness value and high saturation.

[1] KERWIN, J. F., Blue and Brown Prove Best Pulling Colors for Booklet Covers, *Sales Management*, 24: 642, Jan. 29, 1929.

[2] PRESTON, K., H. P. SCHRANKEL, and M. A. TINKER, The Effect of Variations in Color of Print and Background on Legibility, *Journal of General Psychology*, 6: 459–561, 1932 (col. *A*); SUMNER, F. C., Influence of Color on Legibility of Copy, *Jour. Applied Psychol.*, 16: 201–204 (col. *B*); TINKER, M. A., and D. G. PATERSON, Variations in Color of Print and Background, *Jour. Applied Psychol.*, 15: 471–479 (col. *C*); LUCKIESH, M., *Light and Color in Advertising and Merchandising*, pp. 246–251, D. Van Nostrand Company, Inc., New York, 1931 (col. *D*).

[3] For a detailed report of recent studies, see CHANDLER, *op. cit.*, pp. 85–91.

2. Complementary colors in combination are preferred to noncomplementary colors.

3. The desirable color combinations vary with the product, the surroundings, and the group to whom the appeal is directed.

4. Color can be so prominent as to attract attention to itself and so distract attention from the purpose for which the color is used; brilliant colors, combinations with too great an artistic appeal, and color that gives such value to the illustration that it becomes an entity and unit by itself apart from the context that it should clarify detract from the return value of the advertisement, rather than add to it. In this connection, E. T. Grundlach[1] gives the following warning:

> No favorable impression regarding the goods is ever created by advertising that draws the attention and praise to itself as advertising. Fol-de-rol, literary verbiage, extraneous art, obviously clever copy—all these devices make the tyro and the alleged expert say, "There's a good ad." When they say that, it is equivalent to the prospective buyer's feeling, "There's a good salesman," and the prospective voter's thought, "There's a clever politician"—meaning that I had better be on my guard.

TABLE 132.—COLOR PREFERENCES IN VARIOUS STUDIES

A (Preston, *et al.*)	*B* (Sumner)	*C* (Tinker)	*D* (Luckiesh)
Black (B) on White (W)	B on Gray (G)	Blue (Bl) on W	Bl on Yellow (Y)
Bl on Y	Bl on G	G on W	G on W
G on W	Bl on Y	B on W	R on W
Bl on W	R on G	Bl on Y	B on W
G on R	G on Y	R on Y	W on B
R on Y	Green (Gr) on G	Gr on R	Bl on W
R on W	B on Y	K on G	Y on Bl
O on Bl	G on W		W on R

The Coupon.—Another twentieth-century addition to advertising technique is the coupon. The increase in the use of it is shown in a survey of keyed advertisements in the *Ladies' Home Journal* and *The Saturday Evening Post*, made by S. H. Giellerup.[2] Table 133 gives a summary of his results.

TABLE 133.—USE OF THE COUPON

Journal	Per cent of keyed advertisements				
	1921	1925	1929	1933	1937
Ladies' Home Journal	28	44	40	41	17
The Saturday Evening Post	17	18	20	9	17

[1] GIELLERUP, S. H., Advertising Technique Marks Time: little change in physical make-up during the last four years, *Advertising and Selling*, 29: 31, Oct. 21, 1937.

[2] Coupons in Advertising, *Printers' Ink*, 177: 113, Dec. 10, 1936.

The value of the attached coupon has been estimated in a number of studies. In his investigation of 2,349 advertisements, Starch found four times as many replies from those with coupons as from those without. Simons[1] reports that two advertisements, identical in every respect except that one had an attached coupon, resulted in 90 per cent more replies for the coupon-attached advertisement. Its value, however, lies not merely in the increased returns that it often brings; it serves as a means of identifying the advertisement, by including a key or department number, thus making computation of returns from different types of advertisements possible.

To be effective the following rules should be observed:

1. The name and address of the advertiser should be inserted in the coupon.
2. The space for the signature should be adequate. Too small a space destroys the effectiveness of many coupons.
3. It should be placed in the corner, rather than in the center or body of the advertisement.
4. It should be separated from the body theme by a dash rule, thus suggesting perforations and ease of detachment.
5. It should contain, or refer to, an illustration of the free offer that the returned coupon brings. Starch's results from one study showed that the presence of an illustration in the coupon increased its return value by 8.1 per cent.

External Factors

The Size of the Advertisement.—Since 1890 there has been a steady increase in the size of advertisements. Table 134 summarizes a study made by Giellerup[2] of the changes in the size of advertisements in different magazines for varying periods.

TABLE 134.—CHANGES IN THE SIZE OF ADVERTISEMENTS

Medium	Contrasting periods	Average change per ad
Century Magazine	1872–1913	38 lines to 168 lines
Literary Digest	1900–1920	4 column inches to 20
Farm Journal	1900–1918	1 column inches to 6½
Boston Transcript	1890–1918	5 column inches to 16
New York Tribune	1890–1918	5 column inches to 14
The Saturday Evening Post	1906–1922	22% to 76% full-page ads
Ladies' Home Journal	1906–1921	18% to 72% full-page ads

By 1921 advertising had reached the final stage of the transition from small space to large, and has held approximately the same ratio since then.

[1] SIMONS, E. N., To Increase the Pulling Power of Advertisements, *Printers' Ink*, 146: 109–112, Dec. 15, 1921.

[2] GIELLERUP, *loc. cit.*

The obvious purpose of the increased size is to increase its attention-getting capacity, to convey more information, to provide room for illustrations, and to secure more returns. Whether or not it has succeeded in accomplishing these things and whether or not the increased expenditure has been justified is doubtful. Experimental work on the attention value of the full-page versus the half-page and the quarter-page advertisement has shown that the full page has from two to six times the attention value of the quarter page and from 1.3 to 2.5 times the value of the half page.[1]

The return value of increased space has been given various interpretations. Starch seems to think that the relation is linear—*i.e.*, the return value increases as the space increases—and gives one report from a study of 1,395,800 returns from 907 advertisements,[2] in which the following ratios held:

1 page:½ page:¼ page:⅙ page::100:50:25:17.

The most commonly accepted interpretation of the relationship is the "square-root law," *i.e.*, the value of the space varies with the square root of the area. A study by A. T. Falk[3] of the returns from advertising conducted by the Gordon van Tine Company, in which over 1,000,000 returns from keyed advertisements were analyzed, seemed to show that neither the linear rule nor the square-root law held. He studied "the relative efficiency of different-sized advertisements of a similar grade of copy in a given medium in a given month of the year," by computing the cost in terms of mail-order returns. His results from the advertisements in three mediums are given in Fig. 44, and led to his establishing the formula:

$$Y = .6X + 40$$

in which $Y = \dfrac{\text{space cost of advertisement}}{\text{total number of inquiries}}$ and X = size of space used. His cost ratio was as follows:

½ page:1 page:2 pages::6:10:16.

These results would seem to indicate that, other things being equal, the relative effectiveness of an advertisement becomes progressively smaller as the size of the space increases; however, for increased volume the large space is more reliable than the smaller; but even then, the unit

[1] A detailed account of such experiments will be found in STARCH, D., *Principles of Advertising*, pp. 536–578, McGraw-Hill Book Company, Inc., New York, 1923; POFFENBERGER, A. T., *Psychology in Advertising*, pp. 176–199, McGraw-Hill Book Company, Inc., New York, 1932; BURTT, *op. cit.*, pp. 158–178.

[2] STARCH, D., *Analysis of Over 3,000,000 Inquiries*, D. Starch, 420 Lexington Avenue, New York, 1927.

[3] FALK, A. T., Analyzing Advertising Returns, *Harv. Business Rev.*, 7: 185–194, 312–329, 1928–1929.

cost per return is larger than if the quarter or half instead of the full page were used.

The Position of the Advertisement in the Medium—Magazines are in two groups: (1) flat, in which the advertising and reading material are intermingled; (2) standard, in which the two are in separate sections. In the flat magazines the three preferred positions are the three cover positions. In the standard magazines, the preferred positions are indi-

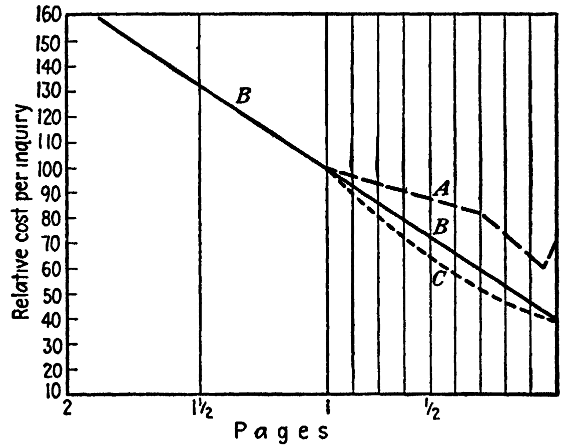


FIG. 44.—Relative cost of inquiries resulting from advertisements of various sizes: *A*, state farm papers, *B*, national farm papers, *C*, general magazines. (*After Falk; reproduced by permission of the Harvard Business Review*)

cated by the rates; uniformity of charge usually prevails, except for the back cover and the second and third covers, in which the charge rates are usually 1.7 and 1.25 times the cost of the inside pages. Among the inside pages, the following have been shown to have more attention value than the others—the page facing the third cover, the pages facing the beginning and end of the reading sections, and the page facing the table of contents.

Of more importance for the average advertisement is the position that it has on the page. Experiments and field surveys have shown that some positions are much more valuable than others. Adams[1] exposed block capital letters tachistoscopically in different parts of the page and asked his subjects to report those first noticed. Table 135 summarizes some of his results.

Another type of study is reported by C. D. Benner.[2] A record was kept of 10,000 inquiries from an advertising campaign conducted in 43 newspapers, in which the advertisements were inserted on different pages

[1] ADAMS, H. F., *Advertising and Mental Laws*, p. 93, The Macmillan Company, New York, 1916.

[2] BENNER, C. D., Position and Pulling Power, *Printers' Ink*, 172: 25–29, Aug. 8, 1935.

and on different parts of the page. The relative values of different parts of the page are reproduced in Fig. 45.

TABLE 135.—NUMBER OF TIMES SEPARATE PARTS OF THE PAGE WERE SEEN FIRST IN PER CENT

Section of page	Left side of page		Right side of page	
	4 divisions	2 divisions	4 divisions	2 divisions
Top one-fourth	25		22.3	
Second one-fourth	. 17.5	33.3	18.3	28.2
Third one-fourth	4.8		6.9	
Last one-fourth	1.8	21.2	3.7	17.2

These results definitely favor the upper part of the page, particularly the right side. Similar studies corroborate Benner's results on the superior return value of the upper right side of the page, although repeated

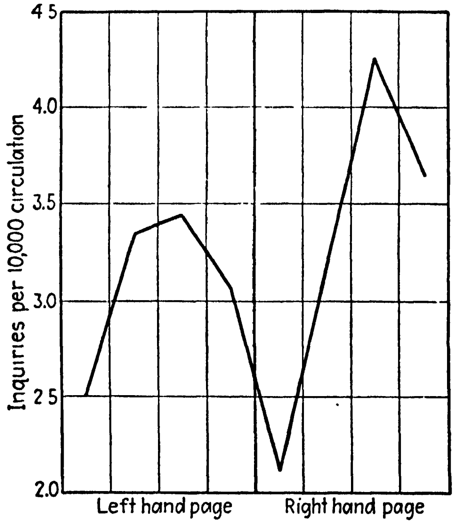


FIG. 45.—Inquiry production by position on page. (*After Benner.*)

studies, particularly those concerned with attention value, suggest the superiority of the upper left. The upper part of the page is so much more valuable than the lower part that Benner suggests: "It may be desirable to pay a premium for a specified position on a particular page, or at least give the newspaper two or three days leeway in the insertion date."[1]

Location in the newspaper or magazine is also important. Benner's results showed unaccountable preferences for certain pages; page 8 was consistently more productive than any other page, and close to it were

[1] *Ibid.*, p. 29.

pages 3, 5, and 12; on the other hand, pages 4, 6, 9–11, 18–22, consistently gave poor returns. Starch shows equally striking differences in his survey of 3,750,261 returns from 2,107 advertisements in magazines. Figure 46 gives his ratio for different pages.

The superiority of the first five and the last five pages is obvious; in comparison with any other 10 pages of the magazine, the first and last five pages have from 50 to 80 per cent advantage.

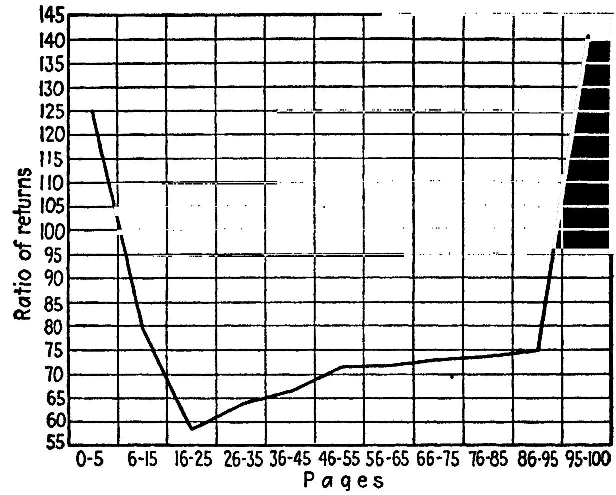


FIG. 46.—Ratio of returns to advertisements on different pages. (*After Starch.*)

The Time of Appearance.—Three variables affect the results—the time of the day, the week in the month, and the month in the year. The fact that men prefer and read the evening paper, while women are more likely to read the morning paper, is the major factor determining the time of the appearance of advertisements addressed exclusively to either sex. A survey of the reading habits of businessmen, doctors, and lawyers[1] showed that approximately 80 per cent of all three classes read only the evening paper.

The month in the year in which the advertisement appears is an important consideration. Two studies of returns from similar advertisements in different months have been made. Starch[2] computed the monthly ratio of 3,998,245 returns from 2,500 newspaper and magazine advertisements, and Falk[3] computed the monthly ratio from over 1,000,000 returns from the advertisements of one company. The results from both studies are combined in Fig. 47.

[1] HOTCHKISS, G. B., and R. B. FRANKEN, *Newspaper Reading Habits of Business Executives and Professional Men, in New York*, New York University Bureau of Business Research, 1922.

[2] STARCH, *An Analysis of* 5,000,000 *Inquiries*, p. 19, 1935.

[3] FALK, *op. cit.*

The inferences from the charts are obvious. Starch reports that the results from both magazines and newspapers are approximately the same, and that there is very little variation in different products.

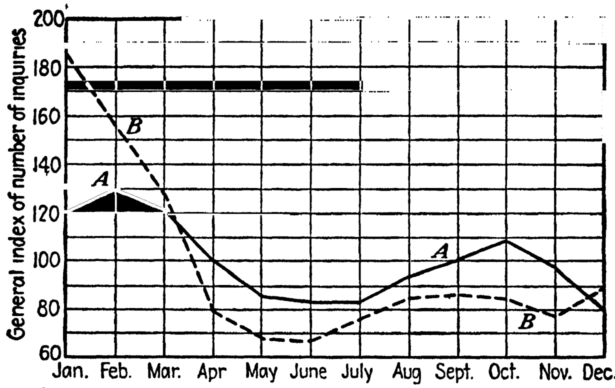


FIG. 47.—General index of number of inquiries produced by advertisements according to month of issue. (*A, after Starch; B, after Falk.*)

There seems to be some variation, also, because of the week in the month in which the advertisement appears. Starch's results show that the 4 weeks stand in the ratio of

100:127.9:120.3:103.5.

Frequency of Appearance.—The law of repetition has been accepted in advertising as infallible—the more often an advertisement appears, the more likely it will be to attract notice and the more certain it is to produce action. Adams gave repeated proofs of the increased value of frequent insertions, and suggested that repetition is a greater factor in attracting attention than is increased size. The ratio of returns for one, two, and four insertions were 1.0:1.49:2.60 in one study, and 1.0:2.63:4.05 in another.

Disturbing results from frequent insertions are reported in Falk's survey. His results showed that the insertion of an advertisement twice or three times per month, instead of once, gave very few additional returns.

> Over an eight-year period, the insertion of two advertisements per month instead of one, in two magazines, resulted in an increase in eleven cases and a decrease in twenty-two, over the normal inquiries coming in from one insertion per month; and the insertion of three advertisements on four separate occasions resulted in a very small increase in three cases and an equally small decrease in the other case.[1]

The purpose of additional insertions is, of course, to increase the attention value of the advertisement. Surveys by the Psychological Corpora-

[1] *Ibid.*, p. 321.

tion show that if an advertisement does not attract attention in its first issue, it will not be likely to attract attention in successive issues. Starch's surveys showed a rapid decrease in returns during the first 3 weeks after the appearance of the advertisement, descending from a ratio of 50 the first week to 5.2 the fourth week.

The primary importance of the law of repetition—once one of the most widely accepted and established laws—has been questioned during the past few years, especially since the start of the Gestalt movement. Repeated proofs have been given that repetition, per se, will not establish an association. Repetition must be for a purpose and in relation to an end; without the establishment of the end, mere repetition will have very little effect. In other words, if the central issue of the advertisement, the body theme, is not sufficiently conspicuous to catch the attention of the reader, the repetition of the same advertisement will be of but very little value.

Additional Factors.—Other external factors that affect the returns are the volume and territorial circulation of the medium, the quality of advertising that the medium contains, and the economic class of readers who subscribe to the medium. Information regarding each of these factors is usually supplied by the publication, and can be checked at the Audit Bureau of Circulation.

TESTING ADVERTISEMENTS

The necessity for some form of test of advertisements is recognized today by everyone responsible for the large expenditure that the advertising task forces on an organization. Very few men are willing to trust their own judgments regarding the value of their efforts; advertisements are tested, either before they are published, or during a preliminary period of limited advertising, or after they have been in circulation.

Prepublication Tests

The tests that have preceded the publication of the advertisement have been of two kinds—historical and judgment tests.

Historical.—For this type of test a study is made of the advertising technique that has been successful in the past, and on the basis of the results that successful advertisements have produced, a similar advertisement is suggested. At times, this takes the form of a product-history study, and at other times, the form of a study of advertising cycles, the former assuming that the advertisements which produced results in the past will do so in the future, and the latter assuming that advertising ideas, forms, and techniques move forward in cycles, and that the form in which an advertisement should appear depends upon the phase of the cycle in which advertising is at the time. For example, if the comics are

on the wane and are about to be replaced by another style, a guess is made at the change, and the nature of the advertisement is changed accordingly.

The difficulty with this method of evaluation is that, in the world of advertising, the past is a poor indicator of the future; techniques change so rapidly that the relation between the past and the present is uncertain. At times, a style is changed because of a local or national fad; at others, because of a wide interest in biographies, inventions, or even detective stories. The variability and impermanence of many human interests cause wide fluctuations in the use of the tool that is designed to arouse or appeal to them.

Judgment.—Another prepublication device is to display two or more alternative advertisements, and ask for a judgment of coworkers regarding their relative merit, and to request a selection of the best advertisement. Sometimes this judgment is limited to members of a committee, sometimes to officials in an organization, sometimes to some of the workers in the organization, and at other times to a supposedly representative sampling of "outsiders." The most common method is to limit the estimates to the judgments of a small group of "insiders."

In general, the closer one is to a device and the more interest one has in it, the less objective will his judgments be. Advertisers and producers view their wares in a different way from consumers. Parents are notoriously poor judges of their children. Unbiased estimates are more likely to be gained from those who have had no share in the production of the material. It is for this reason that increasing numbers of companies are ignoring the judgments of experts and pinning their hopes on the judgments of consumers. Starch has used this method in a number of his studies, usually asking for judgments of three aspects—the layout, the headline, and the text—and then pooling and averaging the judgments, in order to obtain an estimate of the appeal or attention-getting promise of the advertisement.

The necessary caution in such tests is that the group that is selected be sufficiently large and representative to indicate general reactions. The method most commonly used is the order-of-merit method, in which judges arrange the suggested forms in rank order, in terms of the value of the advertisement as a whole, or in terms of its merit for some particular quality, *e.g.*, its attention-getting value, its persuasiveness, its vividness, its sincerity, or the clarity of its central theme. The difficulty with the rank-order method is its impracticability when there are many choices. Selection of what is judged to be the best is comparatively easy, but grading a collection of 12 or 15 different samples is an impossible task, as no person is capable of comparing so many separate items. Another weakness of the order-of-merit method is its dependence for its criteria

for attention-value, persuasiveness, or whatever quality is judged, upon the judgment of the individual customer. The assumption is that numbers will give adequate distributions so that personal idiosyncrasies will not distort the results unduly. As a tool for selecting the one best advertisement, it has considerable value, if the sample of customers is large enough and is carefully selected.

Trial Advertising

This kind of advertising test has been done in a number of ways, the two most common being the "local-area sales test" and the "consumer-jury test."

Local-area Sales Test.—A test of this kind is often used as a preparation for a national campaign. Two or more territories are selected, in each of which different forms of advertising are used for a period of time, and the sales in these territories are checked against one another and against the sales during the same period in similar territories in which there is no advertising. An illustration of this type of test is given in a study made by the W. F. Young Company[1] in 1929. Seven cities were selected for the test. In one city, advertisements 8 inches by 3 inches were inserted in the daily papers twice a week for 4 weeks; and in six other cities, the advertisements, 4 inches by 3 inches, were inserted three times a week for 4 weeks. In each city the sales of the product, Absorbine Jr., made by certain drugstores (134 in all) were compared with the record for the 4 weeks preceding the test, and with the sales record during the same time of drugstores in an eighth city. During the campaign the sales in the advertised cities increased 24.4 per cent, while in the unadvertised city there was a decrease of 35.5 per cent. The results seemed to justify starting a national campaign with the same type of advertisement.

The use of the local-area sales test as a measure of advertising value is subject to many variables, some of which may distort the results and give an incorrect picture of the promise of the advertisement. Concentrated advertising in one or more areas is affected by (1) local conditions—an economic upheaval, *e.g.*, a strike, may disturb the results of all forms of advertising, and give no opportunity for comparison with similar cities; (2) the effect of previous advertising—if there has not been an interval of at least 3 weeks between the previous campaign and the present test, the aftereffects of the previous campaign will distort the results; (3) competing advertising campaigns—should one from a competing company be conducted at the same time, an element is introduced into the campaign that makes comparison impossible; (4) novelties or substitutes that affect one area and not another. In addition to these difficulties, there is

[1] Borden, H. H., *Problems in Advertising*, 2d ed., pp. 415–532, McGraw-Hill Book Company, Inc., New York, 1937.

the task of selecting cities that are strictly comparable—a task that even the most optimistic think is impossible.

Consumer-jury Test.—In *testing* by this method, the agency or department selects certain advertisements that have been used for a short period of time, and asks a number of customers to rank them in the order of their appeal. The ranking is then compared with the inquiry cost of the advertisement. An illustration of this process is given in a study made by the California Walnut Growers Association. Advertisements whose inquiry costs were known were presented to 114 middle-class consumers, with the question, "Which of these announcements would be most likely to attract your interest and lead you to buy walnuts, and why?" Table 136 gives the results.

TABLE 136.—ADVERTISING RETURNS COMPARED WITH JUDGMENTS OF APPEAL VALUE

Advertising number	Theme of advertising	Number of times ranked 1st	Inquiry cost	Reason for selection
446	No more tired menus	60	$ 0.36	Utility and recipe
291	Recipe appeal	20	0.46	Utility and recipe
325	Bargain	11	2.15	Utility and recipe
285	Holiday walnuts	11	13.27	Illustration and coloring
394	Beauty	7	1.24	Appetizing appearance
393	Health	5	1.52	Doctor recommends

The correlation between the judgments of the consumers and the inquiry cost is not particularly high—.5—but it is significant that the two advertisements with the lowest inquiry cost were the two selected as first choice most frequently by the consumers.

Another use of the consumer-jury method is to test the extent to which consumers have made an association between a slogan or an advertisement and the company sponsoring it, after the advertisement has appeared for a short period of time. Usually a representative sample of the population to whom the advertisement is addressed is selected and interviewed to discover what percentage of them have noticed the advertisement or remember having seen it. Two measurement methods are used: (1) the recall method, in which the slogan or illustration is given to the consumer and he is asked to name the company that is using it or the product with which it has been associated; (2) the recognition method, in which a copy of the magazine where the advertisement appears is given to the consumer for a short time, and then he is asked to mention a list of the advertisements that he saw, and to say if he remembered seeing some particular advertisements. Sometimes the advertisement is mixed with a number of unpublished advertisements, and the

consumer is asked to identify those which he has already seen. Dr. Gallup, Dr. Starch, and Mr. Percival White have used this method as a basis for the reports from their surveys. Equipped with copies of the magazines in which the advertisement appears, surveyors visit the homes of subscribers and invite them to go through the pages of one issue and point out those advertisements which had been particularly noticed, and at the same time to tell whether they had read all or part of the advertisement and whether or not the product is being used.

The weaknesses of this technique are many.

1. It assumes that memory for an advertisement is related to the act of purchasing the product advertised. It is true that an advertisement must be noticed before action can be secured; the resulting action, however, is dependent upon the advertisement's having created or enhanced a value for the reader. Memory for an experience and value of an experience are not necessarily related.

2. Many advertisements are noticed because of their irrelevancy, and read as a source of amusement. A customer may be able to recall having seen the advertisement because of its unusualness or distinctiveness, while at the same time the advertisement appeals to no interest of the customer and creates no value for him.

3. It is subject to the usual difficulties of the interview—the inability of some interviewers to gain the cooperation of the consumer, the lack of intellectual honesty on the part of some customers, resulting in their eagerness not to be "shown up" to their disadvantage, and the per cent of chronic advertisement readers who use them as a means of killing time.

Post-publication Tests

Testing of this sort is used by many concerns, not so much for the sake of the knowledge of the effects that the advertisement has had, but for the sake of the influence that such knowledge will have on successive advertising.

One method used is to compare the results for a period during and after the campaign with the results for a similar period previous to the campaign, or with the results for a similar time during the previous year. Sometimes this method is refined a little by using different types of advertisements in different mediums, and keying the advertisement, either by the use of different colors or by the use of differently numbered coupons. This technique assumes (1) that the advertisement has been responsible for the change in the sales ratio; (2) that specific factors in the advertisement were responsible for its success. How reliable these assumptions are is uncertain. Repeated studies of mail-order inquiries from differently colored advertisements have given conclusive proof of the superiority of some colors; and these have lent support to the value of the technique. Studies of coupon returns have not revealed such convincing evidence. Dr. Gallup[1] has shown that the average advertisement draws coupon replies from less than 0.1 per cent of the readers

[1] Gallup, Dr. G., *The Advertising World*, 68: 2, August, 1936.

of the magazine, and that the use of the coupon, especially when there is a free offer, is not a certain index of the effectiveness of the advertisement.

Another method used frequently is the so-called *pantry study*, in which housewives are asked to check, from among a large list of commodities, those which they have in their possession. The difficulty with such technique is that the list of possessions will quite often include many "leftovers" and products that are very rarely used, and that these will, from the standpoint of list of possessions, be just as important as those which are frequently replaced.

Another method, which has been adopted by H. C. Link,[1] is a study of consumers' buying habits as an index of the popularity of certain advertised products. His method is not so much a measure of sales as it is a measure of people; it is an attempt to find out whether more or fewer people are buying products as a result of the advertising and sales campaigns that have been conducted. Six times each year a corps of trained interviewers visit the homes of 4,000 housewives (50 per cent of the interviews are with the husband, also), and ask such questions as:

What brand of coffee did you buy last?
What brand of cigarette do you smoke now?
What brand of gasoline do you use now?

On the basis of these bimonthly surveys, a comparison is made between the buying habits of people in successive periods. The following table will serve to illustrate the type of results. The question "What brand of cigarette did you smoke last?" was asked at three different times. The results are given in Table 137.

TABLE 137.—SMOKING HABITS OF MEN AND WOMEN
(After Link)

Brand of cigarette	Men			Women		
	March, 1934	September, 1934	May, 1935	March, 1934	September, 1934	May, 1935
A	30.6	29 8	29.6	22 5	23 6	22.0
B	27.6	28.0	24.6	34.9	30.5	29.8
C	25.4	22.0	21.1	22.4	19.2	15.5
D	5.8	6.0	7.5	4.6	4.3	6.7
E	1.5	1.8	1.4	3.6	2.0	2.4

The change from one study to another is an index of the increased or decreased use of the product, and gives a measure of the effectiveness of

[1] LINK, H. C., *The New Psychology of Selling and Advertising*, The Macmillan Company, New York, 1932. See also, How to Test Your Advertisements, *Advertising and Selling*, 62: 17–19, Feb. 3, 1932.

the campaign of any particular company in comparison with that of competing companies. The value of the method is enhanced when the results are supplemented by such other tests as coupon returns, local sales tests, and general sales results.

The method has some difficulties and possible objections.

1. The subjects interviewed may not be representative of the economic class that is tested. Link's surveys usually cover the middle economic class, and from a number of statistical studies, he has shown that a sample of 4,000 from the *B* and *C* economic classes, if properly distributed over the entire country, will give a representative sampling that does not err more than 3 per cent from the results that would be secured if the whole population were interviewed. Repeated checks, by the use of different samples, have shown a correlation between two sets of results of .95 and better. To secure this, however, it is necessary that particular care be given the selection of the sample.

2. The replies may not be reliable. To test this, Link has had his interviewers repeat the visit within a week of the previous visit, and, to cancel the effect of a single interviewer, a different one has visited the home the second time; again the correlation runs sufficiently high to warrant confidence in the results. It is quite true, as Balchin[1] points out, that many people are not capable of answering detailed questions regarding their habits, and that many others will not answer what they regard as personal and unnecessary inquiries. The lack of cooperation is, however, much more likely to be due to the nature of the questions and to the temperament of the interviewer. Approximately 10 per cent of questions pertaining to commonly used commodities cannot be answered by the average person, but that does not destroy the effectiveness of the remaining 90 per cent. The necessity of a careful selection of the interviewers, and some training in "query" technique, is obvious.

3. Is there any necessary relation between the practice of buying any particular brand and the effect of the advertisement? Lazarfeld[2] suggests that the value of such a method of testing will depend upon the manner in which the question is formed. For example, if customers are asked such a question as, "Why did you buy this brand?" only 2 per cent will credit the act to advertising; whereas if the question were, "What led you first to buy this brand?" 24 per cent attribute the choice to the advertisement. This form of question is one which, repeated experiments have shown, people cannot answer with any degree of reliability. Ask yourself what led you to buy your last car about 2 or 3 years ago, and the factors that distort the reliability of the replies will be apparent. Faulty memory, rationalizations, competitors, possible bargains—any number of reasons may be given today, many of which were of no significance at the time of the purchase. Our memory for immediate experiences is notoriously inaccurate; for remote experiences it is so confused with rationalizations that it is a rare person who can account for his acts.

Testing advertising is far from being the exact science that has been attained in many other fields; the results are often unreliable because of the impossibility of isolating one factor and evaluating that in terms of all the other variables which may affect it. Advertising is primarily a social

[1] BALCHIN, N. M., A Psychological Approach to Market Research, *The Human Factor*, 7: 375–385, November, 1933.

[2] LAZARFELD, PAUL, The Outlook for Testing Effectiveness in Advertising, *The Management Review*, 25: 3–12, January, 1936.

phenomenon and, as in most other social issues, methods of evaluation are dependent upon statistical results from surveys, some of which are often gathered under conditions that make accuracy of report an impossibility.

Topics for Report

1. Classify the advertisements in any one issue of *The Saturday Evening Post* in terms of (*a*) the nature of the appeal that is used; (*b*) colors versus black and white; (*c*) the proportion of full-page, half-page, and quarter-page advertisements; (*d*) the number that seem to you to violate advertising principles.

2. In a different issue of *The Saturday Evening Post*, examine the full-page and half-page advertisements in terms of (*a*) clarity with which the central theme is given, (*b*) value of the illustration to the central theme, (*c*) outstanding accessories that add to the significance of the central theme.

3. Go through three or four issues of any daily paper and select those advertisements that have caused you to stop and read part or all of the advertisement. Why did you stop, and what gave the advertisement its distinctiveness?

Required Readings

1. Hepner, H. W.: *Psychology in Modern Business*, pp. 498–576, Prentice-Hall, Inc., New York, 1931.
2. Husband, R. W.: *Applied Psychology*, pp. 351–454, Harper & Brothers, New York, 1934.

Supplementary Readings

1. Link, H. C.: *The New Psychology of Selling and Advertising*, The Macmillan Company, New York, 1932.
2. Burtt, H. E.: *Psychology of Advertising*, Houghton Mifflin Company, Boston, 1938.
3. Poffenberger, A. T.: *Psychology in Advertising*, McGraw-Hill Book Company, Inc., New York, 1932.

Key to Slogans on Page 472

1. Metropolitan Life Insurance Company
2. Zip (Jean Jordeau, Inc.)
3. Cracker Jack
4. Sherwin-Williams Company
5. Portland Cement Association
6. Paris Garters
7. Packer's Tar Soap.

CHAPTER XVI

PSYCHOLOGICAL FACTORS IN SELLING

Salesmanship is composed of a relationship between two entities, a salesman and a potential customer, and is concerned with the exchange of goods or ideas that act as intermediaries effecting barriers or bonds between the two; all three forces are instrumental in determining the nature of the result. The feelings, attitudes, and behavior of the two personal forces are different. The salesman is in a state of hopeful expectancy, has temporary control of the goods, and possesses the knowledge that may be instrumental in their release. His behavior is affected by the morale, the prestige, and the reputation of the organization that he represents, as well as by the specific techniques that he has acquired for presenting his wares. The customer's feelings and attitudes are determined by his confidence in the integrity of the salesman, as well as by the extent to which a conscious need for the possession of the goods is experienced. The degree to which that need is experienced determines the efforts that will be expended to satisfy the need, and the extent to which the presented goods will produce that satisfaction is determined by the manner in which it measures up to the standards that have been consciously or unconsciously set up.

The selling act is complcted when the services offered by the salesman meet at a common point with the conscious needs of the customer, and when the attributes of the goods approximate the standards that have been established by the customer. To appreciate the forces that are effective in the act of selling, the two most important forces in the psychological situation, the salesman and the customer, must be understood.

Obviously, the salesman is the dominating factor in the situation; he is the center around which the whole pattern of activity revolves; to complete the selling act, he has to change the selling situation from a salesman-centered situation to a customer-centered situation; the readiness with which he can make that conversion determines the speed with which the act will be successfully completed. What should he be like, and what are his necessary weapons?

THE SALESMAN

What salesmen should be like has so frequently been the subject of discussion by those who have and have not had experience in seliing that it

has become a parlor game. The commercial spokesman interprets the essential qualities in terms of three P's—pep, personality, and power; the economist, in terms of knowledge of the value of the goods; and the psychologist, in terms of essential characteristics the possession of which would convert any normal person into a superbeing.

Qualities Considered Essential

The following lists of essential qualities are representative of those which the commercial man and the psychologist regard as essential for the salesman. The first group is the result of a study made by the sales managers' bureau of the St. Louis Chamber of Commerce. A questionnaire was circulated among 460 sales managers, asking for the 12 essential qualities that they expected their salesmen to possess. The results are given in Group I.

Group I. Sales Managers' Interpretation of Salesmen's Essentials

1. *Good character:* reputation, habits, integrity, self-control, reliability, truthfulness, honesty, fairness, loyalty, sincerity, sobriety, and decency.
2. *Personality:* individuality, address, appearance, cleanliness, manners, and voice.
3. *Health:* vitality, correct habits of life.
4. *Mentality:* education, open-mindedness, common sense, understanding, native intelligence, and ability.
5. *Concentration:* application, tenacity, patience, perseverance, student qualities, self-analysis.
6. *Industry:* energy, capacity for work, enthusiasm, optimism, ambition.
7. *Self-confidence:* courage, preparedness, conviction of competency.
8. *Punctuality:* promptness, ready decision and action, brevity, directness.
9. *Tact:* intuition, sympathy, comprehension.
10. *Initiative:* power of organization, visualization.
11. *Resourcefulness:* alertness, observation, imagination.
12. *Knowledge of his goods.*

The second group is quoted in the *Encyclopaedia Britannica*[1] and represents the considered judgment of a British psychologist.

Group II. Psychologist's Interpretation of Salesmen's Essentials

1. Adaptability
2. Good memory
3. Knowledge of merchandise
4. High standard of conduct
5. Charm of manner
6. Unfailing courtesy
7. Tact
8. Persistence
9. Good command of language
10. Some personal culture
11. Impressive bearing
12. Good powers of observation

The third group is a summary made by Link[2] of the judgments of a number of American psychologists.

[1] *Encyclopaedia Brittanica*, 14th ed., Vol. 19, p. 877.

[2] Link, H. C.: *The New Psychology of Selling and Advertising*, p. 168, The Macmillan Company, New York, 1932.

Group III. Concensus of Opinion of Psychologists on Salesmen's Essential Qualities

1. Loyalty to company
2. Knowledge of products
3. Good moral habits
4. Ability to judge people
5. Sense of humor
6. Social aggressiveness
7. Good judgment and common sense
8. Interest in customer's needs
9. Tact
10. Persuasiveness and ability to talk well
11. Intelligence and alertness
12. Persistence, energy, and industry
13. A pleasing personality
14. A neat appearance
15. Initiative and optimism
16. Good memory for names and faces

The one interesting fact about the above three groups of essential qualities is the differences in the required qualities. Of the 40 qualities that are listed, there are only three—character, personality, and knowledge of goods—that are common to all three; and there are only four additional qualities—mental ability, tact, initiative, and memory—that are common to any two.

This absence of agreement among psychologists and sales managers concerning the essentials of salesmen would seem to indicate that armchair analyses of salesmen's essentials cannot provide an adequate basis on which to proceed in either selecting or training salesmen. It is largely because of this confusion among analysts that so little progress has been made in the psychology of selling. This confusion has its roots in the assumption that there are native qualities that characterize salesmen, and that, once these qualities are known, it is possible to construct measuring rods in terms of which they may be measured. Acting on that assumption, tests of general sales ability have been constructed, oversold, and abandoned; and would-be counselors and employment managers have selected or rejected applicants, only to discover that salesmen of their selection have not lived up to the promise of the test and that salesmen they have rejected have found a place in the same field, but in another connection.

The reaction against typology as a scientific method of analysis, together with everyday observations, has been instrumental in the abandonment of the "native-quality" hypothesis, but the turning point in the indiscriminate use of tests as selection tools for general salesmen came from two directions:

a. The exhaustive study of over 11,000 life insurance salesmen, made by the Life Insurance Sales Research Bureau.

b. The adoption of job specifications as a basis for appraising the tasks of salesmen of specific products.

The former set a standard, method, and technique that have been adopted by a number of other organizations, and that have resulted in the establishment of techniques and methods for selecting, not salesmen in general but the particular men that can represent and sell particular

products to selected customers of different economic and cultural levels. The latter has served to bring to the task of selecting salesmen the methods and techniques that have been of value in the selection of machinists, office employees, and supervisors. The combination of these two tools has produced more valid results than were attained when experimental and survey work was conducted on the assumption that there is a special type of person that can sell successfully, and that psychologists should help the business world to discover him.

The fact that psychological tools, to be effective in the selection of salesmen, must be appraised in terms of the nature of the product that is sold, the territory that is served, the personnel of the organization, and the various incentive and remunerative devices that have been accepted as motivating factors in spurring on the salesman to exert his maximum efforts, has lifted the problem of selecting salesmen from the realm of a simple examination of the individual to an appraisal of the manner in which company-sponsored and environmental factors have affected salesmen of particular products in the immediate past. This has been instrumental in bringing about abandonment of the idea that batteries of tests for selecting salesmen as such can be developed, and has led to the practice of studying salesmen in their economic and environmental setting, and using the results of such studies as bases for predicting the chances for success of present applicants.

Although it is true that tests for selecting salesmen must be constructed in terms of other factors besides the personal qualities of the salesmen, it is also true that there is considerable similarity in the economic and environmental factors affecting salesmen, and that the products that are sold and the territory that is served have many common elements. It is the extent to which common elements can be found that bases for prediction can be established.

Products that are sold can be divided into two classes: tangibles and intangibles. Salesmen can be divided into two groups: field salesmen and counter salesmen. This fourfold grouping lends itself to three significant classes of salesmen:

a. Counter salesmen of tangibles
b. Field salesmen of tangibles
c. Field salesmen of intangibles.

The fourth possible class—counter salesmen of intangibles—can well be combined with the first class, as ideas that are part of the stock in trade of salesclerks can usually be expressed in concrete form.

It is true that there are variations among both the tangibles and the intangibles, and that the person who is successful in selling one type of tangible is not always successful in selling another type. However, the

factors that are common to all the above three groups are of more importance than the differences. It is by a study of these common factors, with due regard for the differences that characterize the demands of particular products, that adequate selection tools and standards of acceptability may be established.

COUNTER SALESMEN OF TANGIBLES

The demands that are placed on salesclerks vary somewhat in different situations. Knowledge of methods of manufacture, distinguishing characteristics of products, methods of demonstrating the significant features of products, and ways in which products differ from those in the same class—such information is peculiar to the demands of particular products, and is gained during the training period. The extent to which a person is familiar with a particular product is not an adequate basis on which to establish a selection system; that basis must be related to the demands that are peculiar to the job. It is upon the basis of job analyses and job descriptions that selection methods must rest. Only when the demands of the job are known can those psychological tools be selected which have been found of value in appraising the qualities that make possible the meeting of these demands.

The Nature of the Task.—Some idea of the demands that must be met by the successful salesclerk are given in two descriptions that are offered—one by O. P. Robinson and the other by W. Raphael. Robinson[1] divides the tasks of clerks into two major groups, service and merchandise.

I. Service
  A. Customer contact
    1. Study human nature and learn best how to handle people
    2. See that customers are approached properly
    3. Sell merchandise in the minimum time necessary to satisfy the customer
    4. Recommend any service the store has to offer that might appeal to the customer
    5. Consult the section manager in case of doubt
    6. Promise customers only what has been authorized by the section manager or the buyer
    7. See that customers are notified when promises must be broken
  B. Store condition
    1. Know and follow store rules and regulations
    2. Be punctual and regular in attendance
    3. Use material from store bulletins and classes
    4. Maintain a good business appearance and manner
    5. Cooperate with all other employees
    6. Understand the rating system

[1] ROBINSON, O. P., *Retail Personnel Relations*, pp. 56–57, Prentice-Hall, Inc., New York, 1940.

7. Use the monthly rating reports as a basis for improvement
8. Use the information given in shopping reports

C. System
1. Know and follow the rules for system carefully
2. Be accurate in making all sales records
3. Be familiar with the departmental system
4. Follow the daily and weekly sales plan
5. Know the system for inventorying merchandise

II. Merchandise

A. Stock care
1. Be responsible to the head of stock for the care of stock
2. Always return stock to its proper place after showing it
3. Never leave damaged merchandise in stock
4. Report merchandise out of stock on the want slip
5. Help to arrange the display in the morning
6. Help to put merchandise away at night
7. Learn the best way to handle the stock
8. Sell merchandise, especially the slow-moving

B. Merchandise knowledge
1. Be familiar with all the merchandise in stock: fashions, styles, qualities, values, materials, sizes, colors, makes
2. Tell customers of merchandise points of value to them
3. Study the manufacture of the merchandise
4. Learn the source of the merchandise
5. Know what merchandise is advertised each day
6. Know what merchandise is on display in the windows

For the above description to be of value as a basis for establishing selection methods, the tasks of the clerk must be translated into necessary qualities and abilities. The duties in the list lend themselves to a division into two categories: *service*, involving customer contact, store relations, and care of stock; and *knowledge*, including familiarity with store rules and selling plans, and the necessary information regarding the product sold.

The analysis that is offered by Raphael[1] is given in Table 138, together with the qualities that are assumed to be necessary to perform the tasks acceptably.

The Use of Tests in Selecting Salesclerks.—The extent to which tests may be of value in selecting clerks can be best appreciated from a study of those that have been found of value in appraising the qualities that analyses have shown to be essential in the selling situation. Such a method of approach was used by Miss Raphael. On the basis of her analysis of the selling task she assembled tests of memory, judgment, arithmetical ability, and attention and supplemented these with guides for estimating the personality qualities that were thought important. The tests were administered to 120 clerks in three departments of a large

[1] RAPHAEL, W., and F. W. LAWE, Seven Years' Experience of Tests for Sales Assistants, *The Human Factor*, 11: 137–145, April, 1937.

TABLE 138.—ANALYSIS OF SELLING ABILITY
(After Lawe and Raphael)

Situations	Qualities Needed
A Selling:	
1. Waiting for the customer	1 *a* Alertness and vivacity
	b Resistance to boredom
2 Meeting the customer	2 *a* Attractive appearance, suitable style of dress, pleasant voice and accent
	b Courteous, sympathetic, cultured manners, considerateness, adaptability, self-confidence
3 Learning the customer's requirements	3 *a* Intelligence, quick grasp of a new situation
	b Immediate oral memory for detail
4 Deciding what merchandise to show	4 *a* Intelligence in summing up the customer's social background, taste, and probable attitude to price
	b Memory for stock
5 Fetching merchandise	5 *a* Energy, quick movements
	b Memory for location of stock
6 Showing goods to customer	6 *a* Enthusiasm, tact, and persuasiveness
	b Easy selling talk
	c Memory for relevant selling points
7 Fetching alternative merchandise	7 *a* Intelligence in appreciating customer's attitude to goods first shown
	b Persistence in desire to please her
	c Patience and good temper
8 Leading up to a decision	8 *a* Intelligence in choosing the best method of clinching the sale
	b Decisiveness, and ability to inspire confidence
9 Making out the bill	9 Speed and accuracy in arithmetic
10 Parting from the customer	10 Sustained interest and friendliness, whether a sale has been effected or not
B Nonselling	
1 Care of stock	1 *a* Neatness, methodical habits
a Maintenance	*b* Appreciation of value of goods
2 Care of stock	2 *a* Industriousness
b Clerical work	*b* Attention to detail, accuracy
3 Relation with other members of the staff	3 *a* Willingness to learn
	b Amenability to discipline
a Supervisors	*c* Interest in the efficiency of the department
b Fellow workers	*d* Cooperativeness; unselfishness; friendliness, habitual cheerfulness

London store. The department managers divided the clerks into two groups: good and fairly good. The scores made by the two groups are given in Table 139.

TABLE 139.—ABILITY TEST SCORES COMPARED WITH MANAGERS' RATINGS

Managers' groups	Department groups (average scores)		
	Group 1 (30)	Group 2 (60)	Group 3 (30)
Good	8.1	7.2	9.7
Fairly good	5.6	4.7	5.5

When the results were pooled, it was found that 40 of the 60 clerks who scored above the median were rated by the managers as good.

Other studies have been made by using a wide assortment of tests, in the hope that some of them would produce a significant correlation with production record or with supervisors' judgments. Craig[1] made such a study 20 years ago. He selected two types of tests, one to estimate preferences and interests and the other to appraise abilities, and administered them to clerks in two department stores, Kaufmann's in Philadelphia and Macy's in New York. His preference-interest tests were of the yes-no type and included such questions as

Are you easy to get acquainted with? Yes No
Do you like to work where you don't have to talk?
Do you like to play checkers?
Do you like letting people do things for you?

The ability tests included many of the well-known and easily administered tests—tests of verbal ability, of judgment, of color naming, of block counting, of association, of discrimination—a total of 26 tests.

The significant conclusion was made that the ability tests disclosed no differences between the successful and the unsuccessful clerks. On the other hand, the preference-interest test disclosed significant differences in the responses of the successful and unsuccessful clerks, and resulted in the adoption of the questionnaire as a selection tool in one of the stores. Had this questionnaire been used as a selection tool when those who were tested had applied for a position, and had the questions been answered in the same way, all but three of the poor clerks would have been eliminated and all but two of the successful clerks would have been accepted.

The same preference-interest test was then applied to an assembly of clerks in the second store and the results were checked against department managers' judgments; in this case no significant relationship was dis-

[1] CRAIG, D. R., The Preference-interest Questionnaire in Selecting Saleswomen, *Personnel Jour.*, 3: 366–374, 1924–1925.

covered between the scores on the test and the sales record of, or judgments on, the clerks. This result is typical of the results gained in other studies and justifies the often-quoted recommendation that tests must be validated in each organization in which they are to be used.

Additional evidence of the futility of experimenting with a miscellaneous assortment of tests is provided in the experience gained by R. H. Macy & Company. After many years of experience with ability tests as possible selection tools for salesclerks, the director of the test division[1] is compelled to admit that

> Lack of adequate tests to determine selling ability prohibits testing our selling force except in three departments where merchandise knowledge is necessary, *i.e.*, Book, Camera, and Wine and Liquors Departments. These tests in no way indicate the ability to sell the item; this is determined by the interview.

This abandonment of the use of tests does not prove that tests are of no value in selecting salesclerks; it merely indicates that an indiscriminate selection of standardized tests is destined to be fruitless.

The conviction that ability tests were not promising tools for selecting salesclerks led Gallup[2] to construct a rating scale as a means of appraising the personality qualities that were thought to be of importance in the selling situation. He asked the personnel managers of 15 large department stores to select those qualities that were important in the selling situation. Twenty-three traits were chosen, and were divided into the following four groups:

a. Complex traits, e.g., ability to learn, in which the clerks were rated as either ( ) refusing suggestions, ( ) knowing it all, ( ) being teachable, ( ) being eager to learn.

b. Specific selling situations, e.g., adaptability to the buyer, in which the clerks were rated as ( ) being able to size up the buyer at once, ( ) being fairly adaptable, ( ) treating all buyers the same, ( ) simply taking orders.

c. Character or moral traits, e.g., courtesy, in which the clerks were rated as ( ) always courteous, ( ) usually courteous, ( ) sometimes courteous, ( ) gruff and unaccommodating.

d. Personal qualities, e.g., likability, in which the clerks were rated for being ( ) well liked, ( ) fair mixers, ( ) unsociable, ( ) disliked.

The average results from the three sets of ratings, made by floor managers and department store buyers, correlated .70 with the estimates of value made by the directors, and led Gallup to conclude that in such a scale there was a tool that could be used in selecting salespeople.

The difficulty in using such a scale in the employment office lies in the fact that it is impossible for an interviewer to create some of the

[1] LEVIN, GERTRUDE, in Experience with Employment Tests, *Studies in Personnel Policy*, No. 32, p. 46, The Conference Board, New York, 1941.

[2] GALLUP, DR. G., Tests of Successful Salespeople, *Personnel Jour.*, 4: 474–482, 1925–1926.

situations on which judgments must be formed. Even if the scale is used in a form comparable to that used in the post-employment stage, and is given to trusted acquaintances for completion, it is impossible for accurate estimates of the most significant issues to be formed.

Some indication of the type of test material that has been found of value in the selection of salesclerks is given in the tentative results that are offered by the Worker Analysis Section of the Division of Standards and Research of the U. S. Employment Office.[1] After considerable experimental work with a large variety of tests it was found that measures of the following abilities and qualities provided significant indexes of promise.

1. *Estimates of Verbal Fluency.*—This can be gained from a well-standardized vocabulary test or from a completion test that has been standardized at the educational level of the applicant.

2. *Capacity for Noticing Details.*—This can be appraised by means of any of the well-standardized checking tests that include names and numbers separately or in combination.

3. *Pattern of Interest.*—The results from such a test as Strong's, scored in terms of sales or contact interest, and varying with the sexes, or the results from any of the other interest questionnaires that include items that appraise one's interest in working with and serving others, caring for property, and attending to details, represent the types of material that have most promise of value.

4. *Personality Factors.*—The particular traits that are essential for the demands of any social and economic situation can be known only when in-company studies of those that make for success have been discovered. Once known, they may be appraised by means of specially constructed interview-record forms accompanied by specific directions for eliciting the qualities that are necessary.

The above four types of items are those that have been found of most value; the weights that are given to the four groups will vary in different situations and can be known only when in-company studies have revealed the relative significance of each as an aid in selection.

FIELD SALESMEN OF TANGIBLES

The contrast between the amount of training given to, and experience required of, field salesmen and store clerks gives an indication of the assumed differences between the necessary qualifications of the two groups. The store clerk is given a week or 10 days of preliminary training or supervised selling before being granted the responsibility for a section of the store; the field salesman is expected to be familiar with the method of construction, of operation, and of repair of the article that he sells.

[1] Quoted in ROBINSON, *op. cit.*, pp. 161–162.

The field salesman's technical training must be supplemented with some production experience, and as a preparation for his field work, he is frequently "schooled" in the plant by being given an opportunity to study the different operating processes by supervised inspection.

The Nature of the Task.—Some indication of the task of the field salesmen—a task that is significantly designated by the title sales engineer—is given in a recently published summary of his responsibilities.[1] In summary form they are described as follows:

1. He must know the characteristics of the product that he sells; he must be convinced of the advantage that such characteristics have over those of competitors; and he must be able to express these characteristics in a form that will appeal to the customer. To be master of this part of his selling task he must know

   a. *Why the product is designed as it is, and in what ways the design may provide the consumer with economical performance under all conditions.* He must know the experimenting and testing through which designs have been evolved, and must be familiar with the stages of development that led to the present form. Only thus can he be confident of the merits of the product and be in the position to offer reasons for the selection of certain materials and the rejection of others.

   b. *How the nature of the raw material and the method of manufacturing the product contribute to its method of operation.* By making supervised observations of the production task, or by gaining production experience, he can account for the care and exactness with which certain parts are constructed; thus he is stored with the technical information by means of which he can provide the well-informed customer or the customer who has had difficulty with similar parts of comparable tools with reasons why they can meet the most exacting demands. The necessity for this is obvious when the customer has had repeated difficulties with specific parts of other machines; the customer who has had frequent burnt-out bearings, or whose car has frequently lost power on a grade, or who has had steering-gear trouble is more concerned with the manner in which that trouble will be avoided than he is with any other feature of the machine. The salesman must be able to talk the language of the customer.

   c. *How it operates under normal and abnormal conditions.* Effective salesmen are potential servicemen; the ability to demonstrate methods of service under hazardous and unusual situations is one of the most effective of the salesman's tools.

   d. *He must also be familiar with the purposes that the tool serves and the manner in which it supplements or can replace the services of other articles in the same field.*

2. He must know the potentialities of the market. This is known only when the potential customers are classified and the following are determined:

   a. *The size and importance of each purchaser in terms of that buying power which is of interest to the sales engineer.* This necessitates familiarity with industrial expansion and contraction, machinery depreciation, and possible replacement of unsatisfactory with improved equipment.

[1] LESTER, BERNARD, *Sales Engineering*, John Wiley & Sons, Inc., New York, 1940.

b. *The nature of the purchaser's production problems and requirements.* This means that the salesman must keep abreast of production problems, of changes in processes, and of demands of new designs. "Intimacy with processes and production and operating personnel yields the greatest dividends, because the active mind grasps and visualizes the problems of the purchaser in a practical way that would be impossible to one working only at the desk."

c. *When the purchaser's needs are most likely to exist and become acute.* The many factors that increase or reduce customers' needs should be potent forces in determining the amount of effort expended by the salesman.

d. *How the customer proceeds in selecting what to buy.* The forces that affect the purchaser of specialties differ from those that affect the salesclerks' customers only in the degree to which the former is affected by economic demands and the need for increased speed and efficiency. These, combined with the usual motives that affect the purchasing act, must be known by the salesman and directed through those channels that will be most effective in consummating the sale.

3. The salesman must know each customer and should be equipped with a plan that is adjustable to the problems of each person. The facts that a salesman should marshal before approaching a potential customer may be divided into three classes:

a. *He should know the position and responsibilities of each person who is influential in effecting purchases.* The effective salesman enlists the support of influential advisors—engineers, technicians, skilled operators—and thus secures the cooperation of advance agents who create interest and demands, before approaching the person who focuses these demands; he works up the line as frequently as he works down, and is considerate of the rights and privileges of those who are to be affected by the equipment. Machines that are forced on operators are criticized much more frequently than are those that are supplied in response to suggestions and requests.

b. *He must know the financial plans of the company.* Departmental budgets are frequently planned in advance; expenses for replacements or additions are somewhat controlled by the planned expense account. A proposal for an outlay that disturbs the departmental budget balance is likely to meet resistance. Knowledge of planned or possible outlay provides the framework in terms of which the sales efforts are most likely to be fruitful.

c. *The salesman should also be familiar with the activities of the company, group, or individual who is contacted.* The problems that are uppermost in the consciousness of those who are determining the policies for replacement, maintenance, and expansion should be known. Knowledge of the other than company forces that affect purchases, of the personal forces that may affect decisions, and of the attitudes that exist toward the company that he represents is essential if recognition is to be given to the fact that merit is but one of the factors that determine action.

The Qualifications of Field Salesmen.—The complaints that are frequently made against field salesmen give some indications of the qualifications that are necessary. The following are typical.

It seems he cannot understand my problem.
He does not seem to know what he is talking about.

The fellow himself or the company he represents never particularly appealed to me. He never made a real effort to get my business.[1]

The above indexes of the matters wherein salesmen "fall down on the job" may be divided into five types of knowledge—knowledge of the market, knowledge of the customer and his needs, knowledge of the product, the salesman's knowledge of himself, and acquaintance with flexible methods of approach. The extent to which a knowledge of the market is a *sine qua non* of the equipment of the salesman is evident from the analysis of a salesman's tasks. Equally apparent is the necessity of his being familiar with the needs of his potential customers. The training period provides means for salesmen to meet these demands, and also familiarizes the novices with effective means of approach. The capacities that should be effective in making the best use of that information are personal qualities that characterize the salesman—his ability to analyze and make use of the features of his product that have an appeal for the customer, and to demonstrate these in such a manner that a conscious need will be intensified and a means of satisfying that need will be convincingly evident. The sales situation is not merely the exchange of one product for another; it is a mingling of two personalities, in which the personal qualities of the salesman are as important a factor in determining results as are the features of the product. The qualities that are most effective vary in different situations; frequently some quality that has disturbing effects on one is instrumental in inspiring confidence in others. In no other situation is St. Paul's judgment of his behavior, "I am all things to all men," more effective than in the sales situation—but the "thing" that is most in evidence in each situation must be determined by the salesman. In spite of the variations in different situations, there are basic qualities that must characterize salesmen if they are to gain the end that is sought, *i.e.*, the establishment of a habit that knits the customer's needs, the company's products, and the salesman's efforts into one pattern. These essentials are:

a. Unquestioned honesty and sincerity.
b. Courteous consideration for others.
c. Confidence in the intrinsic merits of the product.
d. Pride in and enthusiasm for the product.
e. Loyalty to the company.
f. Fair-mindedness in appreciation of competitors.

There are many other assets that will aid the salesman: if his aggressive tendencies are stronger than his submissive; if he is extroverted rather than introverted; if he is interested in making various types of social contacts; if he can participate in and appreciate the hobbies,

[1] LESTER, *op. cit.* p. 177.

side-line interests, and sources of enjoyment of his potential customers; and if he can tactfully avoid arguments and yet press home his point of view—these are assets that will aid him in the same way that they will aid any person who is engaged in contact work. But of and by themselves they will not produce the end result that the salesman must gain—confidence in his moral integrity and intellectual honesty.

The extent to which the qualities that are vital for success can be appraised by means of psychological tests has been a moot issue for many years. Tests that have shown some degree of correlation with salesmen's records have measured the following: memory, powers of observation, social interests, and aggressive or domineering tendencies. The relative fruitlessness of efforts of selecting field salesmen by means of tests has been due to the fact that there are many factors that determine adequacy that do not lend themselves to appraisal in the test situation; a random selection of three of these will indicate wherein tests fall short of appraising the whole situation.

a. Loyalty to the Organization.—A test may disclose one's normal capacity for loyalty, but personal relations within a company and practices that run counter to the convictions of the salesman make it impossible for the good prospect, as measured by tests, to give the company the degree of loyalty of which he is capable.

b. Pride in Work.—Tests may disclose a capacity for pride in products, but an intimate acquaintance with types of material that are used and production methods that are practiced undermine the possibility of carrying the capacity into effect; moreover, personal relations within the company are frequently effective in creating a defensive attitude on the part of the salesman and a critical attitude toward superior officers, and the same attitude is transferred to the product that is sold.

c. The Persistence, Endurance, and Perseverance of the Applicant.—The extent to which these are expressed depends upon two factors—the work habits of the person and the extent to which end results act as continuously motivating forces. The former can be gained from a study of past experience, but the latter fluctuates in terms of the changing value patterns of the candidate. Value patterns change in terms of the frequency with which they are realized and outgrown.

The Use of Tests in Selecting Field Salesmen.—When there are so many factors that cannot be appraised in the interview, to what extent can objective measures give indexes of promise? Undoubtedly such tests as have been found of value in appraising these factors that help make effective social contacts can give an index of the aggressive tendencies, the social habits, the level of excitability, and the patterns of interests of applicants. Such tests as the Allport Scale of Values, the Bernreuter Inventory, the Humm-Wadsworth, and the Kuder Preference Record can be of value in spotting those qualities that will aid or hinder making aggressive contacts. That they will give reliable indexes of promise in the field-sales situation has yet to be shown. One instance provides results that give evidence of their unreliability.

Viteles[1] gave the Humm-Wadsworth Temperament Test to 59 appliance salesmen after they had been selected by the usual procedure. The salesman's pattern with which the applicants were compared was established by Humm on the basis of results from 1,350 salesmen in the following groups: "million-dollar men," life insurance salesmen, Coca-Cola truck salesmen, neon-light salesmen, and laundry-route men. Viteles compared the "profiles" with the acceptable profile, à la Humm, according to two established scoring methods, and checked the results against the subsequent records of the men. The following were the results:

a. Twenty of the 59 had acceptable scores according to the log-scoring method; 60 per cent of these resigned or were released during the training period.

b. Thirty-one of the 59 were employable according to the combination scoring method; 71 per cent of these resigned or were released during the training period.

c. Twelve of the 59 were unemployable according to the log-scoring method; 59 per cent of these were released or resigned during the training period.

d. Sixteen of the 59 were unemployable according to the combination scoring method; 50 per cent of these were released during the tryout period.

This relatively small study indicates that if a candidate for a sales position had an unemployable Humm-Wadsworth Temperament pattern he would have had as good a chance of being satisfactory during the trial period as if he had an employable pattern.

These results are to be expected when the personality demands of salesmen are matched against the estimates of qualities that are made by any standardized personality test. Such tests are designed for one purpose, clinical, and are usually concerned with discovering the factors that may cause disturbance; they do not pretend to measure the qualities that are vital for success in any occupation; at their best they appraise the qualities that may give promise of trouble. If personality tests are to be of value for any group, the qualities that they attempt to appraise must be the same as or similar to the occupational demands of the group.

What tests or objective forms of examination may be of value in selecting field salesmen? Those that have been found of most value have been summarized by Viteles[2] and Kornhauser,[3] and are as follows:

1. *The Application, or Personal-information, Blank.*—Considerable evidence is at hand to prove that significant information may be gathered by means of the application blank; however, the items that are significant are known only when a study is made of the records of present salesmen and when the records of the successful and unsuccessful salesmen are compared. Those experiences, responsibilities, and personal data that

[1] VITELES, MORRIS, *The Value of Psychology in Selecting Salesmen*, Market Series, No. 45, pp. 23–25, American Management Association, New York, 1941.

[2] *Ibid.*, pp. 20–28.

[3] KORNHAUSER, A. W., and R. N. MCMURRY, A Scientific Procedure for the Selection of Salesmen, *Personnel*, Vol. 15, No. 4, 1939.

characterize the successful men and are not characteristic of the unsuccessful are the items that will prove of value in selecting others. The items will differ in different companies and in the sale of different types of products, and the number of significant items will vary in each study. Those that are significant in one type of work may have no value whatever in another. A comparison of the results from three studies will indicate the extent to which researches in different fields result in identical and different factors. The results are given in Table 140.

TABLE 140.—SIGNIFICANT FACTORS IN THE APPLICATION BLANK

Study I[1]	Study II[2]	Study III[3]
1. Age	1. Age	1. Age
2. Length of time at last address	2. Education	2. Education
3. Make and age of car owned	3. Marital status	3. Marital status
4. Type of previous sales and management experience	4. Occupation	4. Sales experience
5. Marital status	5. Service	5. Offices held
6. Business experience	6. Insurance carried	6. Dependents
7. Number of dependents	7. Club membership	7. Number of investments
8. Discharge record	8. Sales experience	8. Club memberships
9. Earnings expected	9. Indexes of self-confidence	9. Years out of school
10. Ownership of furniture		10. Home ownership
		11. Insurance carried

[1] KORNHAUSER, A. W., and R. N. MCMURRY, A Scientific Procedure for the Selection of Salesmen, *Personnel*, 15 (No. 4): 6, 1939.
[2] GOLDSMITH, DOROTHY, *Jour. Applied Psychol.*, 6: 149–155, 1922.
[3] RUSSELL, W., and G. V. COPE, *Public Personnel Studies*, 3 (No. 7): 202–219, 1925.

How significant any of these factors may be in selecting salesmen for a particular company cannot be told beforehand; the fact that some of them have no value in one company is given in a study made by Schultz.[1] He made a study of the customary data gathered in the application blank in one company, and found that there were no significant differences between the successful and the unsuccessful salesmen in the following indexes: age, educational level, experience, racial stock, and length of service. The items on which there were consistent differences were found in responses to issues in a personality questionnaire, particularly those questions that measured the strength of extrovert and aggressive tendencies.

2. *The Responses to Items in Personality Questionnaires.*—The inauguration of personality questionnaires as a means of discovering differences in methods of reaction to situations, differences in experiences,

[1] SCHULTZ, R. S., Test-selected Salesmen Are Successful, *Personnel Jour.*, 14: 139–142, 1935.

feelings, and attitudes, as well as differences in control over potentially disturbing symptoms, has been one of the most significant and worthwhile tools for "spotting" potential successes or failures among candidates for sales positions. Every well-controlled study has disclosed differences in the responses to questions related to these issues; some studies have shown that the "extrovert" tendency characterizes the successful salesman, others have shown the aggressive or ascendant tendency to be his outstanding characteristic, and others have shown a high degree of energy and enthusiasm characterizing the "million-dollar men." One study is typical. Dodge[1] administered the Bernreuter inventory to 75 specialty salesmen, and found that 41 of the 125 items in that scale were answered differently by the successful salesmen and the unsuccessful. These items were concerned with the following:

a. Worry tendencies—relative freedom from such among the successful.
b. Moody and self-conscious tendencies—less frequent.
c. Attitude toward criticism and discipline—less resentful.
d. Self-interest—less tendency to talk about self.
e. More radical and less conventional than the average.
f. Above the average in self-confidence, self-sufficiency, aggressiveness, and willingness to assume responsibility.

Other studies have disclosed other factors; in one of the most exhaustive studies that have been made—a study that included 1,600 salesmen and that extended over a 2-year period—Kornhauser found four aspects of personality that were significant.

a. The extent to which the salesman is confident of the accuracy and validity of his beliefs and opinions. To appraise this tendency Kornhauser presented the salesmen with a number of controversial statements on which each one formed a judgment; the frequency with which the salesmen checked statements as "certainly true" or "certainly false" gave a measure of the degree of confidence they possessed. Such statements as the following were used as measures:
Prohibition was a success as an experiment.

Certainly true   Probably true   Doubtful   Probably false   Certainly false

b. The extent to which such qualities as self-confidence, enthusiasm, energy, and emotional balance are present. The tools that were used to measure such qualities were the yes-no type of question. From a large collection of questions that appraised the strength of such qualities those were selected on which the successful and the unsuccessful differed. Typical among these were such questions as

Do you ever work for a long time on puzzles, tricks, or problems?	Yes	No
Do you make decisions quickly?	Yes	No
Do you have an especially good memory for faces?	Yes	No

c. A measure of self-judgment. This was estimated by means of three lists of descriptions of characteristics. The salesmen were asked to read through each list

[1] DODGE, A. F., What Are the Personality Traits of the Successful Salesperson? *Jour. Applied Psychol.*, 22: 229–238, 1938.

and place a 1 before the description that fitted him best, a 2 before the next, and so on through the six. Typical of such lists is the following:

__________Industrious, energetic, persevering (with explanations)
__________Sociable, cordial, cheerful
__________Analytical, critical, intellectual
__________Ambitious, eager to get ahead
__________Tactful, diplomatic
__________Enthusiastic, eager, spirited

d. An estimate of preferences. This was gained by listing 12 situations and asking for a first, second, third, and fourth choice for each of the four alternatives in each situation. The following is typical:

Which of the following organizations would you prefer to belong to?
__________A political group setting out to gain control in your community
__________An organization to protect its members against financial loss
__________A well-known club of leading people in the community
__________A little-known club where members informally loaf and enjoy themselves

The four parts of this test contained 400 items; during the latter part of the study it was found that the information gathered by means of the items in sections *a* and *d* did not increase the validity of the test to any significant extent, and they were omitted, as well as a number of items in sections *b* and *c* that showed a high correlation with other items. The resulting test included only 68 items.

The above study has been outlined at some length because of its significance as a pattern, in addition to the value that it has as an indication of the futility of adopting any standardized personality test as a short cut to an examination of an individual. Qualities of personality are the most significant factors in any type of contact situation, but the qualities that are most significant and the tools that will most validly appraise these qualities are known only when their effects in the sales situation are studied by the indirect way of comparing the behavior, feelings, experiences, and attitudes of the successful and the unsuccessful men in the field.

3. *Interest Patterns.*—Probably the most valuable tool for selecting salesmen that psychology has provided is in the form of measures of dominant-interest patterns. Among the many measures of this sort that are available, the one that has been most frequently used and has shown the highest validity is the Strong Vocational Interest Blank for Men (revised edition). Evidences of the value of this tool as a means of selecting life insurance salesmen are given later; while there is not so much convincing evidence of its value in selecting field salesmen of tangibles, there is a considerable amount of evidence that the results from such a test should be weighed before a person is entrusted with field responsibilities. The scale provides no single sales pattern of

interest for field salesmen. Its value lies in the extent to which its results disclose, or fail to disclose, a dominant interest in contact work and supporting interests in fields that are closely related to the product that is to be sold; for example, the prospective salesman of construction equipment should receive an A or a B+ in one of the interest patterns that are identified with contact work, at the same time that he should receive a B or better score in such positions as production manager, engineer, or president of a manufacturing company; the interests that support the dominant interest are as significant as is the chief pattern.

The above four types of appraisal material have little or no value in themselves. They are on a par with any other unbiased estimates that may be made of a candidate, in that they provide specific data for an extended interview and make the interview more definite and meaningful than it would be if temporary moods, past experience, and first impressions determined its contents. No measures that are provided by psychological research lend themselves to such definiteness that people can be categorized and labeled because of the disclosures; the findings from tests and questionnaires provide raw data for an interview that is conducted around the varying results that may be gathered from whatever tests may have been used, and that is directed in such a manner that the test disclosures are refuted, supplemented, corroborated, or discounted, according to the extent to which they fit into the appraisal pattern that is in the process of construction.

FIELD SALESMEN OF INTANGIBLES

The Nature of the Task.—The task of selling ideas or services is different in a number of ways from that of selling packages.

a. The potential customer is rarely as conscious of the need as is the purchaser of packages.

b. The customer has frequently been the victim of costly and fruitless ideas, and has built up a wall of resistance that is not easily surmounted.

c. The idea cannot immediately or in a short period of time be converted into tangible or appreciably measurable form.

d. The idea frequently represents a service to others, and the degree of interest in others is unknown.

e. The clarity with which the idea is presented depends on the capacity of the salesman to present it in correct graphic, picturesque, or verbal form; and the facility for appreciating the description varies from one customer to another.

Confronted with such a situation, the salesman can rarely follow an established plan. He depends for his success upon the manner in which he can understand a state of mind, a need for service, and a capacity for appreciating means of satisfying that need, as well as the extent to which he can match the services that he offers with the particu-

lar forms that the need takes, and can translate his services into such a form that the consciousness of the need will be intensified.

The most frequent form taken by such services is that of life insurance selling. To a somewhat lesser extent it appears in the form of services offered by financial, economic, and management consultants; by educational, religious, and vocational counselors; and by social, medical, and legal advisers.

Any analysis of the task of such a salesman must be concerned with the intangible and personal-relation factors, rather than composed of a list of the duties and responsibilities that normally are catalogued under the job title. The task has been summarized by Strong[1] under these five headings:

a. That of discovering customers' wants and attempting to satisfy them. These wants are on two levels—those of which the customer is aware (positive wants), and those of which the customer is not aware (the negative aspect of the want). The manner in which they can be satisfied is known only when economic condition and conflicting wants are understood.

b. That of understanding and removing obstacles that may prevent the satisfaction of the want. These obstacles may be of infinite varieties, are usually personal, and are frequently expressed in indirect form. The salesman must understand their implications and seek their removal.

c. That of providing a solution that will meet any demands that may arise. The solution is not merely concerned with the immediate problem; it is related to any problem that is or may be connected with the future interests of the customer insofar as it is related to the idea.

d. The reasons why the solutions will meet the need in a completely satisfactory manner. These reasons are related to the merits of the idea or plan and are also in harmony with the present and likely future financial condition of the applicant.

e. The feelings of satisfaction and enhanced ego that are the natural consequences of the solution. These feelings may not be in evidence; their enhancement is as much a part of the sales talk of the salesman as is the presentation of the idea. His task is the establishment of a habit, the continued existence of which depends on the level of emotional experience that resulted from its inception.

The analysis that is suggested by Strong presupposes the existence of a conscious need. In such cases, the first task of the salesman is the discovery that such a need exists. The ensuing steps—intensifying the consciousness of the need, arousing interest in the available means of satisfying the need, creating a desire for these means, and securing action—are orderly and progressive, but vary in the form of presentation according to the extent to which such factors as relevant questions, apparent appreciation, and degree of interest change the manner in which the idea should be developed. The successive steps that form a temporal sequence in such a sales program are outlined in Table 141.

[1] Strong, E. K., *Psychological Aspects of Business*, pp. 30–32, McGraw-Hill Book Company, Inc., New York, 1938.

These steps presuppose the existence of a conscious need. When the need does not exist, the task that confronts the salesman is more complex. His first task in such situations is that

TABLE 141.—SUCCESSIVE STAGES IN THE ACT OF SELLING

Stages	Methods of Performing Each Stage
1. Plan the interview	1. *a.* Locate the prospects
	b. Know the prospects and select as the first to be interviewed the one whose immediate needs can be satisfied by the product
	c. From a knowledge of the needs, prejudices, ambitions, and preferences of the prospect, determine the characteristics of the goods which will adequately satisfy the needs
2. Win the interview	2. *a.* Be self-confident; look and feel important
	b. Be persistent—never become discouraged
	c. Suit the introduction to the occasion; use a strong opening sentence: dramatic when appropriate, unusual occasionally; offer service
	d. Secure the interest and cooperation of subordinates of the prospect
3. Gain the customer's attention	3. *a.* Present a plan of the proposal and awaken curiosity and interest
	b. Show the practical value and profitable possibilities of the goods
	c. Relate the goods to immediate needs and possibilities
4. Arouse the customer's interest	4. *a.* Be interested in the customer's needs and problems
	b. Relate merchandise to customer's needs
	c. Inject intensity and contrast in the demonstration
	d. Avoid and dispel counter attractions
	e. Present a clear picture, by the use of the dramatic and the graphic, and of analogies, similes, and metaphors
5. Create a desire for the goods	5. *a.* Use two tools: suggestion and reasoning
	b. Give proof of value by demonstration, test, and testimonial
	c. Give information about the method of manufacture and the distinctive qualities of the goods
6. Secure action	6. *a.* Watch for the occasion when needs seem to be met; secure agreement step by step
	b. Summarize the values that appeal to the customer
	c. Present alternatives or offer compromises

of creating needs, establishing values, and arousing interest in the general field, instead of seeking for action in relation to the specific aspects of that field which are his ultimate concern. The tools that are at his dis-

posal are not related to the merits of his wares; the time is not ripe for the wares to be described or for the particular merits of his plan to be announced. His immediate concern is the creation of wants, the awakening of dormant interests, and the diversion of patterns of thought and emotional trends into channels that will flow in the direction of his means of satisfying the need.

The forces that are at his disposal for creating that want are in the form of basic desires and acquired values; lacking the specific knowledge about the customer that is essential for the culmination of the sales act, he is compelled to appeal to those universal desires and values that motivate the behavior of most people. These desires may be divided into the following three groups:

1. *The Desire to Gain Something.*—It may be health, wealth, social standing, prestige, recognition, knowledge—any of the innumerable forces that the exigencies of habit, experience, and environmental factors impose upon the person.

2. *The Desire to Be on a Par with or to Outwit Others.*—Pride, envy, imitation, rivalry, and curiosity are the driving forces that affect the intensity of the need and determine the effectiveness with which it will compel action.

3. *The Desire to Protect Self and Others.*—Fear, security, and the presence or possibility of danger in the form of sickness or accident are the impelling forces that can be played upon to accentuate the vividness of the need and to convert desire into action.

The values that are at the disposal of the salesman for use are limited by the ends that his salable ideas may help to realize and by the extent to which such values play a part in the thought life and in the emotional patterns of the customer. Values are of infinite varieties. Those that may be of significance in the sales situation may be classified as

a. Utilitarian.
b. Social.
c. Altruistic.

The extent to which any one value will be effective is governed by the importance of that value in the life of the customer and the speed with which the salesman gains an appreciation of its importance in his life.

In addition to the appeal to desires and values, the salesman has two other tools—suggestion and reasoning. The extent to which they have value in the sale of intangibles is determined by the degree to which the salesman appreciates the social and logical forces that affect the behavior of the customer. Their possible uses in the sales situation have been enumerated by Tosdal,[1] and are summarized in Table 142.

[1] TOSDAL, H. R., *Principles of Personal Selling*, pp. 121–124, McGraw-Hill Book Company, Inc., New York, 1925.

The Qualifications of Salesmen of Intangibles.—The fact that job descriptions of this type of work are rarely made has been responsible for the many collections of generalities when attempts are made to tell what salesmen should be like. Some evidence of their essentials can be gained from the outline of tasks suggested by Strong; others may be gathered from the reasons that are offered for failures. The following is an attempt to interpret these tasks in terms of human demands, and to supplement these by a catalogue of the converse of those qualities that are assumed to be responsible for failures. Under the first caption may be grouped the following:

TABLE 142.—CONTRASTING USES OF SUGGESTION AND REASONING IN SELLING
(After Tosdal)

Suggestion is of value when selling:	Reasoning is of value when selling:
1. Convenience goods; those which a consumer will not go out of his way to purchase	1. Shopping goods, in which the buyer "shops around"
2. Repeat goods for which there may be subsequent purchases at rather regular intervals	2. Specialty goods, for which there is not likely to be any repeat order
3. Low-priced goods which satisfy a minor want	3. High-priced goods which call for a large initial payment
4. Luxury goods, which can be sold through other than utilitarian appeals	4. Industrial goods, with exact specification demands
5. Gift goods	5. New goods
6. Delayed-purchase goods, as a means of establishing good will	6. Immediate purchase goods for which the demand is immediate and compulsory

a. Familiarity with the plan to be sold and conviction that it has merits that will benefit the customer.

b. Versatility in methods that are used to present the plan.

c. A capacity to analyze the wants and needs of the potential customers, and to translate these into such forms as will convince the customer that satisfaction is assured.

d. The ability to analyze and follow the thought patterns of the customer and to present such aspects of the plan as will harmonize with these patterns and direct them in the desired channel.

Supplementing these necessary capacities are such abilities and qualities as the following:

a. The ability to plan a campaign and follow it in a logical and orderly manner. This does not mean the adoption of an inflexible plan; rather, it means the tentative formulation of a plan and the modification of it as changes in succeeding stages are warranted.

b. A capacity for hard and continuous work.

c. Such qualities as are assets in all types of contact work: tactfulness, moderated aggressiveness, optimism, interest in making social contacts, an objective rather than a subjective attitude toward others' problems, and sincerity.

The Use of Tests in Selecting Salesmen of Intangibles.—The collection of qualities and abilities that are given in the above group provides the preliminary basis on which tests may be chosen for appraising promise. It is evident that many of the qualities are those that are customarily subsumed under the term personality; it is also apparent that some level of analytical ability is necessary.

The tests that have been offered to appraise level of promise have been of all varieties. Those that have shown the most promising results have been concerned with estimates of qualities rather than measures of ability. These estimates have been of different types.

1. *Interest Tests.*—The significance of interest in a field as a determinant of success is self-evident. An appraisal of the nature and strength of that interest is not easily made without the assistance of objective measurements. For some time it has been recognized that declarations of interest in a particular field are not synonymous with knowledge about the field, nor are they any guarantee that the interest is based on any other factor than stories about success or admiration for a devotee of the field. For such declarations to be significant, the types of work and contacts that the exercising of the interest necessitates must be known, and must be preferred to competing tasks. These are known only when the elements that compose the interest pattern are known, and when the attitude toward and knowledge about these elements are measured.

TABLE 143.—CORRELATIONS BETWEEN INTEREST PATTERNS OF LIFE INSURANCE SALESMEN AND OTHERS

A. Positive.	
Real estate salesmen	85
Sales manager	82
Advertising manager	64
Lawyer	52
Social science teacher	48
Y M C A secretary	46
City school superintendent	41
B Negative:	
Chemist	− 91
Physicist	− 88
Mathematician	− 82
Printer	− 78
Architect	− 73
Psychologist	−.63
Doctor	− 56

The composition of the pattern of interests that are common to salesmen of intangibles has been the object of considerable study The tool that has been most frequently used in analyzing that pattern and comparing its contents with those of patterns that characterize employees

in other fields is the Strong Vocational Interest Blank for Men. This test has been widely used as an aid in the selection of insurance salesmen. The differences between the composition of their interest pattern and that of representatives in other fields is indicated, in a general way, in the varying correlations between the test results from representatives in the different fields. Table 143 summarizes some of the extremes.[1]

The above table suggests that there are many common elements between life insurance salesmen and real estate salesmen in their interest patterns and many opposite elements in the interest patterns of such salesmen and mathematicians, physicists, and printers.

The specific elements that constitute these interest patterns are apparent from the weighted values that are given to selected items in the interest blank; those that are common to a majority of successful salesmen are given varying positive values; those that are disliked by varying percentages of the same are given varying negative values.

Support for the significance of some of these items is found in a study made by Verne Steward.[2] As a result of a study made of the "survivors" from 1,500 agents, he concluded that those who were successful had such interests in common as

a. A liking for demonstrating automobiles.
b. Preference for interviewing clients rather than auditing books.
c. Preference for marketing a product rather than designing it.
d. A fondness for initiating and completing business arrangements.
e. A desire to avoid as much detail work as possible.

These are indicative of the types of activities that successful salesmen of intangibles prefer; the complete pattern is known only when the interests that relate to the various phases of a person's work and leisure pursuits are known.

Some evidence of the significance of interest patterns as determinants of success is given in the experience record of those who show varying degrees of correspondence with the standard pattern. In a follow-up study made by Strong,[3] it was found that 85 per cent of those who scored A in the interest pattern were regarded by management as satisfactory; this was 66 per cent greater than those who scored B+, 93 per cent greater than the B's, and 240 per cent greater than the C's.

2. *Personality Questionnaires.*—Of the many studies available, the most comprehensive is that reported by the L.I.S.R.B.; this included a study of the responses of 1,000 agents to 500 items in a composite ques-

[1] Manual for Vocational Interest Blank for Men, pp. 12–13, Stanford University Press, Stanford University, Cal., 1940. See, also, *Personnel*, 13: 34–35, 204–216, 1934.

[2] Steward, Verne, *Composite Inventory and Examination*, p. 7, published by the author, 5471 Chesley Avenue, Los Angeles, Cal., 1941.

[3] Strong, *op. cit.*

tionnaire, and resulted in the selection of 81 items with a valid difference in the responses of the successful from the unsuccessful salesmen. Steward conducted a shorter study among the survivors of 1,500 selectees with the use of the 125 items in the Bernreuter inventory, and checked the results against those gathered from interviews and field observations. The joint result of these two studies is the assumption that successful salesmen display the following traits more frequently and in greater degree than the average adult: self-confidence, self-assertiveness, agressiveness, emotional adjustment, and an understanding of people.

They respond with a "Yes" to such questions as

Do you try to get your own way even if you have to fight for it?
Do you usually object when a person steps in front of you in a line of people?
Do you occasionally bargain over prices with tradesmen or junkmen?
Are you talkative at social gatherings?

They respond with a "No" to such questions as

Do you dislike finding your way about in a strange place?
Are you troubled with shyness?
Do you find it difficult to speak in public?
Do you lack self-confidence?

The danger to which such questionnaires are exposed—answering in terms of assumed desirable responses—is checked by supplementary multiple-choice tests or by asking for illustrations of behavior. Steward uses the specific-instance method of checking the results, and asks for illustrations of behavior[1] of 10 types, for example:

a. Have you solicited funds for a cause in which you were interested? If so, give the cause, the circumstances, and the amount raised.

b. Have you ever rebuked a workman for failing to have your work done on time? If so, give reason for rebuke, method of rebuking, and general outcome.

The Life Insurance Sales Research Bureau checks the results from the yes-no series of questions by means of a multiple-choice questionnaire in which choices to 12 issues are arranged in four-division rank order, for example:

Which of the following things do you most want the world to provide for you?

____*a.* Personal liberty and freedom to express your individuality.
____*b.* A position where you can influence large numbers of people.
____*c.* Certainty that you will always have enough to live comfortably.
____*d.* Distinction and prestige; the admiration of your fellowmen.

In each of the 12 issues the four alternatives are arranged in order of preference.

[1] STEWARD, VERNE, The Development of a Selection System for Salesmen, *Personnel*, 16: 124–136, 1940.

A measure of the extent to which such personality traits affect behavior is not easily made. This is due to two factors:

a. The so-called personality traits do not exist as independent entities, nor do they influence behavior as isolated entities.

b. The composite pattern that they represent has been affecting past behavior.

Controlled studies of the additional effect that estimates of such qualities may have on behavior have been in terms of the manner in which those with similar past experience who possess these personality qualities differ from those with the same, or similar, experience who do not possess the qualities, as measured by the test. The single experiment that has estimated this additional effect has been conducted by the L.I.S.R.B.[1] This was done by comparing the sales records of those who scored in the different levels in a rating chart (a weighted total of significant factors in the application blank) and the records of the same agents in a combined rating chart and personality test. The differences in the two percentages gives some estimate of the contribution that the measured personality traits make. In this study a comparison was made of the first-year production of survivors who were twenty-six years old and over. Taking 100 per cent as the average, the production records of the different groups were compared. Table 144 gives the results.

TABLE 144.—COMPARISON OF PRODUCTION RECORDS OF SALESMEN

Group	Production ratio: rating chart, per cent	Production ratio: rating chart and personality, per cent	Differences, per cent
A	195	206	11
B	102	137	17
C	63	78	15
D	76	39	−37
E	47	41	−6

The implication from the above table is that the chief contribution made by the personality estimates is in a more adequate selection of the fit and a more thorough elimination of the unfit; the exact contribution of the personality factors may be more evident if they are used as basic selection tools.

3. *Personal History.*—The importance of the application blank as a selection tool is evidenced by the frequency of its use. The value of the asked-for information has been the subject of many studies during the past 20 years. As a result of these, it is now commonly assumed that there are but few of the items of information that are significant as

[1] KURTZ, A. K., *Measuring Aptitude for Life Insurance Selling*, pp. 8, 11, L.I.S.-R.B., Hartford, Conn., 1938.

selection tools. These vary in different situations, and for different types of selling. Those that are of most importance in selling intangibles have been enumerated in the two studies made by Verne Steward and the L.I.S.R.B. They are as follows:

a. Such Physical Factors as Age, Appearance, Health, Voice.—The importance of each of these factors as determinants of success cannot be reduced to measurable forms. That of the last three is known only through subjective judgments of value; that of the first has been shown in the study of the L.I.S.R.B. Table 145 illustrates the varying significance of age when compared with other important factors in the personal history. The first column contains the possible scores of applicants; the remaining four columns give the varying significance of these scores in terms of the different ages.

TABLE 145.—EFFECT OF AGE ON CHANCES FOR SUCCESS

Score	Significance at age			
	22	32	42	52
40	E (poor)	D (fair)	D (fair)	E (poor)
45	D (fair)	C (good)	C (good)	E (poor)
50	C (good)	B (very good)	B (very good)	D (fair)
55	B (very good)	B (very good)	B (very good)	C (good)

These variations indicate that the ages thirty-two to forty-two are the most desirable in prospects, but also indicate that other factors in the personal history may be sufficiently strong and rich to counterbalance the handicap that the age may give. The fact that is illustrated in Table 145 is true of any other item in the personal history. No one factor is a *sine qua non* for success or a certain index of failure; in the composite pattern that comprises the significant personal history, the slight handicap that one type of experience or one element may impose may be offset by significant factors in other fields.

b. Types of Occupational Experience in Which Applicants Have Shared.—These are of importance because of the fact that one's experience is effective in developing habits and attitudes. The extent to which these habits and attitudes overlap those that are essential for the sales situation determines the future value of past work experience.

c. Economic Status.—The significance of this factor lies in the index that it provides of the improvident or careful manner in which previous income has been disbursed; an unwarranted monthly expense account that is not balanced by provision for the future, as indicated by amount of insurance that is carried, indicates improper care in planning for one's future, and implies that the plans that are projected in the interests of others will be characterized by the same lack of foresight.

d. Social and Family Connections and Responsibilities.—The fact that selling is a social-contact task necessitates that those who participate in it be socially minded. The most reliable index of this quality is the provision that has been made for meeting social needs. These are commonly satisfied in two channels, the home and organized institutions. The extent to which a candidate has participated in the responsibilities that are usually associated with these gives an index of his sense of social responsibility,

and suggests the level of his consideration for the social factors that will affect his contact with others.

e. Length of Experience in Previous Jobs.—The assumption underlying this factor is that the habit of roving from one job to another either cultivates or expresses undue ambition or erraticism. On the other hand, the fact that a person has remained with a number of types of work for a sufficiently long time to exhaust their possibilities indicates the presence of persevering tendencies.

This catalogue of significant factors in previous history is not exhaustive. It does not take into account the various experiences that are necessary to develop those personality traits that are assumed to be essential for success. These factors represent expressions of some traits, and may be more exact measures of their effectiveness than that gained by means of direct estimates.

Topics for Report

1. What types of selling could not easily be included in the three subdivisions that are suggested in this chapter?
2. In *Advanced Management*, April–June, 1941, pp. 50–58, Asa S. Knowles has suggested a rating form for measuring the performance of salesmen. What objections may be raised against the inclusion of any of the seven factors; what is the justification for the different ratios?
3. In what ways does the task of training salesmen differ from that of training apprentices for the skilled trades? Is salesmanship an art or a skill?

Required Readings

1. Crane, G. W.: *Psychology Applied*, pp. 234–270, Northwestern University Press, Chicago, 1937.
2. Husband, R. W.: *Applied Psychology*, pp. 455–510, Harper & Brothers, New York, 1934.
3. Link, H. C.: *The New Psychology of Selling and Advertising*, pp. 1–17, 161–226, The Macmillan Company, New York, 1932.

Supplementary Readings

1. Ivey, P. W.: *Successful Salesmanship*, Prentice-Hall, Inc., New York, 1937.
2. Strong, E. K.: *Psychological Aspects of Business*, pp. 3–66, 289–347, 603–616, McGraw-Hill Book Company, Inc., New York, 1938.

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